PRACTICAL DIETETICS

DIET IN HEALTH AND DISEASE

ALIDA FRANCES PATTEE

Mary C. Wallace.

PRACTICAL DIETETICS WITH REFERENCE TO DIET IN HEALTH AND DISEASE

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BY

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To the Trained Nurse:
Whose daily life is a
blessing to humanity

PREFACE TO THE ELEVENTH EDITION

The continuous demand for this work since its last complete revision in 1910 has resulted in the publication of successive editions almost annually until the time became ripe for another complete revision. The present edition, while preserving as far as possible the original plan of the work, incorporates a large amount of new material in harmony with the latest developments in the science and art of dietetics. Many sections on the treatment of the sick have been entirely rewritten to conform with present hospital practice.

The author takes this opportunity to acknowledge with thanks the valuable advice and assistance given by Mary Swartz Rose, Ph.D., Assistant Professor, Department of Nutrition, Teachers' College, Columbia University, New York City.

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Bellevue Hospital, New York. New York Post Graduate Hospital. Massachusetts General Hospital, Boston, Massachusetts.

Alida Frances Pattee.

New York, February, 1917.

PREFACE TO THE SIXTH EDITION

The very gratifying demand for this work has necessitated the preparation of a sixth edition. Advantage has been taken of this opportunity to revise the book and incorporate, as far as space allows, the latest results of research in dietetics. To meet the growing tendency of physicians to prescribe the exact fuel value of a diet, the total energy value of each recipe has been calculated wherever data as to composition of materials used are available, or the quantities of materials used are fairly constant. A table has also been introduced in which the food value of the materials used in the recipes is given. This will be useful in computing other food combinations, and in calculating the amount of protein, fat or carbohydrates in any dietary, whenever required, without the tedious mathematical processes usually involved in such operations.

It is hoped that a revised classification of food principles, greater emphasis on the value of mineral matter in the diet, and fuller discussion of the fundamental principles of nutrition, will add much to the usefulness of the book.

In the introduction are presented outlines showing the requirements in dietetics of the various State Boards of Examiners of Nurses, and the contents of the book have been rearranged to correspond directly with these requirements. This will materially aid the dietitian in arranging the course of study for the nurse so as to prepare her adequately for her State Examinations.

Many years of experience as an instructor in dietetics in hospitals seem to the author to demonstrate that the "recipe book," so-called, should not be separate from the volume on "theory." Both theoretical and practical work should be

treated together, otherwise, while the subjects are naturally closely allied, the young student becomes confused and is not apt to apply the theory to the practice. In this book she cannot read a recipe without having her attention called to its function in nutrition. Furthermore, for convenience sake, the two should be combined in one book of moderate size. One hundred and fifty pages have been added to this edition with but little increase in bulk.

I take pleasure in acknowledging the valuable assistance rendered by Dr. Mary D. Swartz Rose, Assistant Professor of Household Arts, Teachers College, Columbia University, New York, in the preparation of this edition; also again to express my thanks for valuable material used in the book to Mrs. Ellen H. Richards, Dr. W. Gilman Thompson, Dr. Max Einhorn, Dr. Henry Koplik, Dr. L. Emmett Holt, Dr. Louis Starr, Dr. Frederick C. Shattuck, Dr. Elbridge G. Cutler, Dr. Elliott P. Joslin, Dr. Harry W. Goodall and Dr. Maynard Ladd.

Alida Frances Pattee.

New York, December, 1910.

Extract From Preface to Fifth Edition

I have been particularly pleased to see "Practical Dietetics" accepted as a text-book by so many educational and other authorities. Thus it is to be found in all hospitals of the United States Army; it has been recommended for use by all the various State Boards of Examiners of Nurses that have thus far been appointed; it has been adopted by the military authorities in Canada for the Permanent Schools of Instruction for the Militia, and it has also been added to the Authorized Text Book list of the New York City and Boston Public Schools.

New York, November, 1908.

PREFACE TO THE SECOND EDITION

The very cordial reception of the first edition of Practical Dietetics has encouraged a second presentation.

In the preparation of the second issue the original matter has been thoroughly revised, and important additions made.

For valuable material I am indebted to the following physicians, hospitals and publishers, and gratefully acknowledge their assistance and kind permission accorded by them to quote their several diets.

Dr. W. Gilman Thompson, Professor of Medicine in the Cornell University Medical College in New York City and visiting physician to the Presbyterian and Bellevue Hospitals:

Dr. Max Einhorn, Professor of Clinical Medicine at the New York Post-Graduate Medical School and Hospital, visiting physician to the German Dispensary:

Dr. Henry Koplik, attending physician Mount Sinai Hospital, ex-president of the American Pædiatric Society:

Dr. L. Emmett Holt, Professor of Diseases of Children in the College of Physicians and Surgeons (Columbia University), attending physician at the Babies' Hospital and Foundling Hospital, New York:

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Dr. Frederick C. Shattuck, Professor of Clinical Medicine in Harvard University, visiting physician Massachusetts General Hospital:

Dr. Elbridge G. Cutler, Instructor in Theory and Practice at Harvard Medical School, visiting physician Massachusetts General Hospital:

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D. Appleton & Co., Blakiston & Co., William Wood & Co., and the publisher of the Dietetic and Hygienic Gazette:

And sincere thanks are due Mrs. Ellen H. Richards (Instructor in Sanitary Chemistry, Massachusetts Institute of Technology) for aid and information, also for permission to quote from the Rumford Kitchen Leaflets.

A. F. PATTEE.

New York, July, 1904.

PREFACE TO THE FIRST EDITION

As instructor of dietetics at various hospitals I have constantly felt the need of a simple manual and text-book for the use of the nurse in the classroom.

None could be found which fulfilled the requirements as to simplicity, brevity, and exactness, with reference to dietetic treatment in disease.

This same need has been expressed by mothers and nurses outside of the hospital.

In the following pages I have endeavored to meet this need by giving the result of knowledge gained during the past eight years of practical classwork experience in hospitals of different cities.

The preparation of food is a science as well as an art, the chemistry of which is as precise as the chemistry of the laboratory. When we are willing to be as exact and careful in this work as we are in chemical experiments, our success will become a certainty. No other technical art can, with so little practical knowledge, go as far in simplifying that which is otherwise complicated and laborious, or do more toward accomplishing that which is a chief result of all science— adding to the comfort and happiness of the human race.

A. F. Pattee.

New York, July, 1903.

INTRODUCTION

In response to the many requests of Superintendents of Training Schools and Dietitians for an outline of the various State Board Requirements in Dietetics, I quote with permission the given outlines and courses of study in dietetics as arranged by the American Hospital Association, and the various State Boards of Examiners of Nurses. Answers to all questions are to be found in this book. Requirements of other States will be added in each new edition of Pattee's "Practical Dietetics."

These outlines will prove of assistance to the Dietitian in arranging her course of study for the nurse, and will also prove suggestive to the nurse in preparing for her State Examinations.

Through the kindness of the various State Boards of Examiners of Nurses I am also able to quote the examination questions of various States.

A copy of these outlines and examination questions is given in booklet form free with each copy of Pattee's Practical Dietetics purchased. If not secured with the book send direct to A. F. Pattee, Mount Vernon, New York, for same, enclosing five cents for postage and this page cut from your book.

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PART I

PRINCIPLES OF NUTRITION AND FOOD PREPARATIONS

PRACTICAL DIETETICS

CHAPTER I

FOOD: ITS OBJECT

Maintenance of Life and Energy

There are few subjects deserving of more careful consideration than that of food; its composition, preparation, and effect upon the human system; together with the process of its conversion into complex animal tissue, as brain or muscle, blood or bone.

The true science of feeding should be thoroughly studied, that we may understand what properties enter into food; what elements the system demands in order to build or repair; by what means the necessary substances are best supplied, and how to prepare them that the body may maintain its efficiency; so that in case of illness, the least possible demands upon the digestive and assimilative functions may be made.

Apart from the labor of every-day life in which brain and muscle engage, an immense amount of work is performed in the mere act of keeping alive. Nowhere in nature is work performed without a supply of energy, and also some wear and tear of the machine which does the work. This assertion is as true of the human body as of the locomotive, and just as the machine — whatever it may be — requires to be supplied with the conditions necessary for the production of force, so the living body similarly demands a supply of material from which its energy — the power of doing the work — can be taken. As the locomotive obtains the necessary con-

ditions from the fuel and water (and air) which it consumes, so the living body carries on its activities by means of the food, water and air upon which it subsists.

Definition of Food. Foods are substances which when taken into the body supply the necessary elements for promoting its growth and repairing its waste; and furnish it with material from which to produce heat and internal or external work. Substances that are unable to assist in either of these ways are called food accessories or food adjuncts.

Food Accessories or Food Adjuncts. These are substances which, although unable to fulfill the definition of foods, find an extensive use in the dietary, for a variety of reasons. They give flavor to food, increase the appetite, stimulate secretion, and thus aid the digestive functions. They comprise two classes, viz., condiments and beverages.

Source of Food. Food occurs in the mineral, plant and animal kingdoms. It occurs in all physical forms of matter — gases, liquids and solids. Gases are mentioned because oxygen is a true food and metabolized to a certain degree, being always present in the blood and tissues in loose chemical combination.

Composition of the Body. The human body contains many chemical elements in varying amounts.

Nitrogen, carbon, hydrogen, and oxygen are the four present in largest proportion; iron, phosphorus, calcium, magnesium, potassium, sodium, sulphur, chlorin, iodin, also have important offices to perform.

Composition of Food. Foods must contain the same elements found in the body; thus it is that they are able to build and maintain the body structure. But no "one food" contains all these elements in proper proportions for all persons; therefore, it is by combinations of the various food stuffs that we produce a suitable diet. These elements must further be supplied in forms which the body can use. It cannot utilize carbon in the form of coal, for example, but must have it combined in special ways with hydrogen and oxygen. These combinations of elements or "Food Com-

pounds" found in nature (sometimes called "alimentary" or "food principles" and "food stuffs"), are usually classified as proteins, fats, carbohydrates, mineral matter (or salts) and water.

Food, as it is taken into the body still differs in composition from the material utilized by the tissues in growth, repair of waste, and production of energy in the form of work or heat. It must be finally prepared for the use of the body by the processes involved in Digestion.

CLASSIFICATION OF FOOD

Foods may be classified in various ways:

a. According to *Source,* as animal, vegetable, and mineral (including oxygen for combustion).

b. According to *Chemical Composition,* as organic and inorganic, the organic foods being further subdivided into nitrogenous and non-nitrogenous substances.

c. According to *Function,* as tissue-formers, or body-builders; energy (or work and heat) producers; and regulators of body processes.

Classification according to Chemical Composition

$$\text{Organic}\begin{cases}\text{Nitrogenous — Proteins}\\ \text{Non-nitrogenous}\begin{cases}\text{Carbohydrates}\begin{cases}\text{Sugars}\\ \text{Starches}\end{cases}\\ \text{Fats}\end{cases}\end{cases}$$

$$\text{Inorganic}\begin{cases}\text{Mineral Matter}\\ \text{Water}\end{cases}$$

Classification according to Function

$$\text{Tissue-formers or Body-builders}\begin{cases}\text{Proteins}\\ \text{Mineral Matter}\\ \text{Water}\end{cases}$$

$$\text{Energy or Work and Heat Producers}\begin{cases}\text{Carbohydrates}\\ \text{Fats}\\ \text{Proteins}\end{cases}$$

Regulators of Body Processes { Mineral Matter, Water }

Important Sources of Proteins:

Milk, eggs, meat, fish, cheese, beans, peas, lentils, some nuts and cereals.

Important Sources of Fats:

Olive oil, butter, cream, bacon and other fat meat, and nuts.

Important Sources of Carbohydrates:

Cereals, and cereal products; sago, tapioca; starchy vegetables, such as potatoes; sugar, honey, sweet dried fruits.

Important Sources of Mineral Matter:

a. Available in organic form:

Nitrogen,— supplied by protein.

Phosphorus,— in milk and cream, eggs (especially the yolk), meat, whole wheat, oatmeal, dried peas and beans.

Iron,— in eggs (especially the yolk), meat, whole wheat, oatmeal, dried and fresh peas and beans, spinach, raisins and prunes.

b. Available in organic or inorganic form:

Calcium, in milk, dried beans and peas, oranges, spinach, turnips; other fresh fruits and vegetables, and whole grains.

Magnesium, potassium, iodin, etc.— likely to be adequately supplied if the other ash constituents are provided for. The addition of sodium chloride (common salt) as a condiment usually supplies a surplus of sodium and chlorin.

Special Functions of each Food Principle:

Proteins — Supply energy, nitrogen, sulphur, and sometimes phosphorus and iron.

Fats — Supply energy in the most concentrated form.

Carbohydrates — Supply energy in the form most economical to the body.

Mineral Matter — Supplies building material, except nitrogen and sulphur, and helps to regulate body processes.

Water — Supplies building material (forming 60 per cent. of the body), and helps to regulate body processes.

CONDITIONS FOR PERFECT NUTRITION

For the proper support of the human system, a combination of nitrogenous and non-nitrogenous foods is essential, with water to dissolve them and oxygen to burn them. Although air is not classified as a food it is essential to effect the chemical changes needful for assimilation. "About two thousand cubic feet of air need to pass through the lungs of an adult daily in order to furnish oxygen in sufficient quantity. If there is lack in this most important food-stuff (and nothing else can take its place), starvation as truly results as if other food were withheld, for the changes required for nutrition cannot take place, and furthermore incomplete decomposition occurs, which may result in more or less poisonous products.

"Fresh air — air with its quota of oxygen — is, then, a prime requirement in nutrition."— Ellen H. Richards.

A Perfect Food. 1. "A perfect food must contain all the nutritive elements of the body: Proteins, carbohydrates, fats, minerals, and water.

2. It must contain these in their proper proportions.

3. It must contain in a moderate compass the total amount required daily.

4. The nutritive elements must be capable of easy absorption, and yet leave a certain bulk of unabsorbed matter to act as intestinal ballast. It must be obtainable at a moderate cost."— Hutchinson.

A Mixed Diet therefore is necessary, as no "one food" fulfills all the requirements of a "perfect food." A mixed diet must be taken whereby one food may be used to supplement what is lacking in another. The foods best for health are those best fitted to the needs of the individual. The cheapest food is that which furnishes the largest amount of nutriment at the least cost. The best food is that which is both healthful and cheapest.

NITROGENOUS FOODS

Nitrogenous substances are those which contain nitrogen, an element which is essential to the life of every cell.

Classification. In older classifications, the term Protein is used to include all food substances containing nitrogen, this class being further subdivided into (1) *Proteids,* those proteins which can alone maintain the nitrogen equilibrium of the body; (2) *Albuminoids* or *Gelatinoids,* those which contain nitrogen in a form which can replace other proteins only to a limited extent; (3) *Extractives,* containing nitrogen in a form unable to make good the body loss of nitrogen. These extractives are properly food accessories.

Proteins are now defined as compounds of carbon, hydrogen, oxygen, nitrogen, sulphur, and sometimes phosphorus, which contain nitrogen in a form which the body can use. They are variously classified, but a simple division is one into (1) *Simple Proteins,* (2) *Compound Proteins,* and (3) *Albuminoids.* Examples of simple proteins are albumins, globulins, and certain alcohol-soluble proteins found in cereals, as the gliadin of wheat; of compound proteins, the nucleo-protein of organs consisting chiefly of nucleated cells, as pancreas or sweetbread, and the hæmoglobin of the blood; of albuminoids, the familiar product, gelatin, formed from the collagen of connective tissue:

Proteins	Simple	Albumins, e. g.	White of egg. Casein of milk. Myosin of muscle. Fibrin of blood. Gluten of wheat. Legumin of legumes.
		Globulins, e. g.	In grains.
		Alcohol-soluble proteins e. g.	Gliadin of wheat. Zein of maize.
	Compound	Nucleo-protein, e. g. in liver and sweetbread. Hæmoglobin of blood.	
	Albuminoid	Collagen of connective tissue.	

Source. The proteins of the diet are derived both from the animal and vegetable kingdoms. The principal animal proteins are obtained from meats, fish, eggs, and milk. Meat and fish proteins are derived principally from the muscles; egg proteins from both the white and yolk; milk proteins chiefly from the casein, which forms the main constituent of cheese and curds. Animal foods are much richer in protein than plant foods. The only substances of vegetable origin which can compare with animal nutrients in this respect are the legumes (peas, beans, lentils, peanuts, etc.), and certain nuts, such as almonds, pine nuts, cocoa beans (the source of cocoa and chocolate). The entire grain of some cereals possesses a high percentage of protein; this is particularly true of so-called hard wheat, and in lesser degree of oats, Indian corn, rye, and barley. As a rule, flour and meal are about half as rich in protein as the dried grains from which they are prepared, though oatmeal and Indian meal lose but little through milling.

Animal foods are usually digested with ease, and require less cooking and less mastication to insure good utilization; in the form of meat, they are liked because of their high flavor and stimulating properties. In vegetable foods, on account of the presence of cellulose, some of the protein is likely to escape digestion and absorption. For the invalid or convalescent, certain animal foods are preferred as a source of protein, as being more concentrated, and easier of digestion. Of ordinary vegetable food rich in protein, bread, either stale and dry, or thoroughly toasted, is perhaps the most suitable for invalids. Starchy roots and tubers (as potatoes), and green vegetables and fruits, though valuable for other dietetic reasons, are very poor in protein.

Animal Proteins. The *albumins* in the ordinary diet are derived chiefly from animal foods. The white of egg is a very pure form of this compound, and eggs constitute one of the best sources of nitrogen in a compact and assimilable form, especially convenient as they are readily taken raw.

Casein, the chief protein of milk, represents the main

source of this food element for infants and the sick. One quart of milk contains as much protein as six ounces of lean beeksteak, and is more valuable because of its rich supply of mineral matter, to say nothing of the fat and carbohydrate present.

Myosin is the typical protein in muscle tissue. After death it changes to a form called syntonin.

Fibrin and *Serum Albumin,* found in blood, occur to a slight extent along with myosin in meat.

The only *albuminoid* which requires consideration here is collagen, a protein found in all connective tissues, including the modified forms, such as cartilage and bone. This substance is changed by boiling to gelatin. This is further altered by the gastric juice to gelatoses and gelatin-peptones, and finally absorbed, but it lacks certain elements found in albumins and other proteins, and consequently cannot be relied upon exclusively as a source of nitrogen for the body. It can replace about two-thirds of the ordinary protein requirement.

Vegetable Proteins. These are chiefly globulins. The main representatives of the *albumins* in vegetable food are gluten of wheat and legumin of the legumes. A number of alcohol-soluble proteins occur, such as gliadin in wheat and zein in Indian corn. Vegetables contain a large number of nitrogenous substances which are not proteins. Thus while mushrooms contain much nitrogen, little of it is in a form which can be utilized by the body.

Function of Proteins. Proteins are both body-builders and energy-producers, but are little utilized as fuel when carbohydrates and fats are well represented in the diet. As a fuel, they tend to burn up rapidly, and hence are not economical, and since in health only a small proportion of nitrogen is used from day to day, the part not needed being promptly excreted, it is not advantageous to have the diet largely composed of this foodstuff. During the periods of rapid growth, in the prenatal, infantile and adolescent states, when the body is forming new tissue at an unusual rate, there must

be a liberal nitrogen supply. This is also true in convalescence from wasting disease, and sometimes after excessive physical exertion, when the muscle tissue is actually increasing. In health, when fats and carbohydrates are liberally provided, so that the protein is not required as fuel, a comparatively small amount is needed for repair of tissue. This is especially true in old age.*

Nitrogenous Extractives. Substances found in muscle juice, consisting chiefly of creatin, creatinin, and purins (uric acid and related substances), are valuable only as stimulants. They give sapidity to meats and hence are appetizing; possess the power of stimulating the flow of gastric juice, and by their influence on the nervous system, gently increase the activity of the heart. For this reason, beef tea, beef extracts, etc., are of value to the sick.

Cooking of Protein. Of all the proteins, "Albumin," of which there are many varieties, is the most important and needs most care in the cooking to make it easily digested.

The majority of albumins are soluble in cold water and vegetable acids; they are coagulated by heat, mineral acids and alcohol. The cooking of albumin should be governed by these facts.

"As the white of the egg is nearly pure albumin it will serve as an excellent substance for demonstrating the effect of heat on the principal constituent of albuminous foods."

Effect of Temperature or Test for Cooking Albumin

Into a test tube put some white of egg, place in a sauce pan of cold water, heat gradually, and observe all changes.

1. Raw white of egg is a sticky, clear, pale straw-colored liquid, and readily digested.

2. When water reaches the temperature 134° F. white streaks will be seen in a semi-solid white substance which is found to be readily digested.

3. When water reaches the temperature 160° F. the egg will be firm, soft, and jelly-like, and is readily digested.

4. When water reaches 212° F. the egg will be tough white jelly and less readily digested.

* See note page 106.

5. When egg is heated to 300° F. or higher (for example put the test tube directly over flame), the egg will almost immediately become hard and tenacious.

These albumin tests demonstrate that albuminous foods are most tender and readily digested when cooked at a low temperature but when coagulated at too high a temperature are tough and indigestible.

Reheated albuminous foods are less digestible than freshly cooked because the albumin is much hardened by the second cooking. The principal foods requiring care in preparation because of the albumin are eggs, meat, and fish. These will be considered further under their separate headings.

NON-NITROGENOUS FOODS

CARBOHYDRATES (SUGAR AND STARCH): FATS

Strictly speaking, any food substance not protein, even water and mineral water, is non-nitrogenous; but in the restricted sense of food as a source of energy, it is applied to two classes of organic compounds which contain no nitrogen, viz., carbohydrates and fats.

CARBOHYDRATES

Definition. Carbohydrates are food substances which contain carbon, hydrogen and oxygen. The oxygen and hydrogen are usually present in proportion to form the water molecule (H_2O). These substances have therefore been termed carbohydrates. A carbohydrate may be defined as a simple sugar, or a substance which yields simple sugar after hydrolysis.

Source. Carbohydrates come from the vegetable kingdom almost entirely. There are a few exceptions, such as glycogen and milk sugar. They abound throughout the plant world, but especially in grains, roots, tubers, or wherever the plant stores its reserves.

Function. Carbohydrates are burned up in the body to produce energy in the form of work or heat. All that is taken in excess of immediate need is stored, first as glycogen

or "animal starch" in the liver and muscles; and when the capacity to store glycogen is exhausted, in the form of fat. The fuel value of fat is two and one-fourth times that of sugars and starches, so that this is a very convenient form of storage of surplus carbohydrate.

The Most Important Energy Producing Foods are cereals, potatoes, tapioca, sago, fats, sugar and honey.

Classification. Carbohydrates include the *monosaccharides,* as typified in grape sugar; the *disaccharides,* as typified in cane sugar, and *polysaccharides,* including starch, dextrin, gums, cellulose and glycogen:

Carbohydrates
- Monosaccharides $C_6H_{12}O_6$
  - Grape Sugar (Dextrose or Glucose)
  - Fruit Sugar (Levulose)
  - (A mixture of dextrose and levulose is called Invert Sugar. Honey is the best example in nature)
- Disaccharides $C_{12}H_{22}O_{11}$
  - Cane Sugar, Beet Sugar, Maple Sugar — Sucrose
  - Milk Sugar (Lactose)
  - Malt Sugar (Maltose)
- Polysaccharides $C_6H_{10}O_5$
  - Starch
  - Dextrin
  - Glycogen
  - Gums
  - Cellulose

Sugar

Definition. Sugars are carbohydrates which are soluble, have a more or less sweet taste and many minor qualities which distinguish them from the starches. The disaccharides yield monosaccharides under the influence of enzymes or on boiling with dilute acids. When heated to a high temperature sugars form caramel. In dietetics we are especially concerned with grape sugar (dextrose), milk sugar (lactose) and cane sugar (sucrose).

DEXTROSE OR GRAPE SUGAR (GLUCOSE)

Description. Dextrose occurs as a syrup, rarely in crystalline form. It is much less sweet than cane sugar. Other sugars have to be changed to this form before the body can use them.

Sources. It is found throughout the vegetable kingdom, and especially in fruits. A dried fig contains 65 per cent. of grape sugar. In nature it is formed from starch and so it may be produced in art by treating starch with acids. It is prepared on a large scale from cornstarch.

Uses as Food. Dextrose or grape sugar is a fuel food in one of its most readily absorbed forms. It does not require digestion because this is the form to which carbohydrates of all kinds must be changed before they can be of use to the body. Taken in large quantities it is liable to ferment, or flood the system with sugar too rapidly, but as naturally present in sweet fruits, or in its artificial form in small quantities along with other food-stuffs, it is a very economical source of energy.

LACTOSE

Milk Sugar or Lactose. This sugar is found almost exclusively in milk, from which it is commercially prepared. It has little sweetness and does not readily ferment. Until recently it has entered but little into practical dietetics, save in case of infants or others subsisting wholly or partly on milk, but its ease of assimilation and its mild flavor, make it frequently a valuable source of energy in disease, and it is more and more widely used.

CANE SUGAR

Pure cane sugar is chemically the same as beet-sugar. Maple sugar would not be different from common sugar, if it were sufficiently purified to remove the flavoring matter.

Description. Cane sugar occurs naturally in crystals, some of which are extremely hard (rock candy) ; and in syrups, one of which is molasses.

Sources, etc. Cane sugar is found in the sap or juices of a variety of plants, including sugar cane, the beet, the sugar maple, etc. Whether obtained by collecting sap or crushing, etc., it is always at first a syrup and all solid sugar is obtained from these juices by various methods.

Uses as Food. Cane sugar enters into the dietary very largely, pure for table use and in confectionery, or in com-

binations with other foods in cookery. It is a very valuable source of energy, but must be used with discretion, because in too large amounts or in too concentrated form it is irritating to the stomach and liable to ferment, and also because being quickly absorbed, it satisfies the appetite before the need for food has been entirely met, or blunts it so that other foods become distasteful. A pound of sugar and a pound of pure cornstarch are nearly equal in energy value.* For children, it is much better to give sugar in the form of sweet fruits, because they are then supplied with valuable mineral salts which are entirely lacking in pure sugar.

Substitute for Sugars. Since sugar is used not only as a fuel food but as a condiment, attempts have been made to secure a substitute for use in cases where carbohydrate is limited or denied. The best known of these is "saccharin" or "sweetina," a crystalline coal-tar product. It is many times sweeter than sugar, but it has no food value.

Use of Sugar in Practical Dietetics. Sugar taken in small quantities will replace starch weight for weight, and be more easily and quickly absorbed. The amount of sugar which can be taken in place of other fuel food depends on the amount of exercise and the peculiarities of the individual. An excess of sweets may cause nausea and always blunts the appetite, thus cutting down the consumption of other foods. If a very large amount be taken, sugar will appear in the urine. The maximum advisable daily allowance of sugar is considered to be about four ounces.

Sugar should be avoided in gastric disorders, such disturbances of nutrition as gout, rheumatism, and especially diabetes. Being a highly concentrated food, it should be avoided in obesity.

Uses of Sugar in Cookery. Glucose is not so sweet as cane sugar, so that when used for sweetening other foods a larger amount must be taken. In cooking fruits, sugar should be added when the process is nearly complete, as it tends to harden the fruit tissues. By boiling for a long time or in the presence of acids (whether naturally in the fruit or added

* A pound of sugar might all be eaten quickly, but it would be almost impossible to eat a pound of cooked constarch at once.

to it) cane sugar is changed to invert sugar, which is a mixture of equal parts of dextrose and levulose. While dextrose is not so sweet as cane sugar, levulose is very much sweeter, so that the resulting product has a peculiar, penetrating sweetness that is not so well liked as the cane sugar flavor. This is another reason for reserving the sugar till the end of the cooking process.

Test for Sugar. A simple test for sugar, irrespective of whether it is glucose or cane sugar, consists in adding a little 33 per cent. solution of caustic soda to the suspected solution, and boiling. If sugar is present the solution turns brown.

The chief test for glucose or grape sugar alone is Fehling's. A test solution should be on hand, and may be obtained at any apothecary's. It should be obtained fresh. The test is based on the fact that glucose "reduces" salts of copper, i. e., by depriving them of some of their oxygen, an insoluble oxide of copper is precipitated. The test solution contains sulphate of copper, caustic potash and tartrate of sodium and potassium. To make the test, add to a portion of the test solution a few drops of the suspected solution in a test tube and boil. If a red substance precipitates, glucose is present. The sole use of this test for the nurse will probably be in connection with diabetes, when the nurse makes the test at the request of the medical attendant. In all other tests for sugar, the first test mentioned above will suffice, and would also suffice for diabetic urine were it not for the fact that a shamming patient could deceive the nurse by placing common sugar in her urine.

Starch and Other Polysaccharides

Starchy foods form a large part of the ordinary diet of man; they are the chief source of the carbohydrates. Starch, unlike sugar, is insoluble but may be made to pass into a soluble form by dry-heating at high temperature, or by certain digestive ferments. The first bodies formed are known as dextrins, but ultimately a sugar (maltose) is produced. The alimentary starches may be said to comprise starch

proper; dextrins or soluble starches; and glycogen or animal starch, which is stored up in the liver.

Source. Starch occurs widely in the vegetable kingdom, along with grape sugar. It is found in largest amounts in grains, seeds, roots and tubers. It is prepared for the market chiefly by mechanical means, being washed out of the finely cut vegetable substances. Its main commercial source is probably wheat, but it is also made largely from potatoes, rice, arrow-root, etc.

Description. In its pure state, i. e., when isolated from proteins, cellulose, gum, etc., starch is a shining white powder having a distinctive quality to the touch. Under the microscope it is found to consist of granules, which are insoluble in cold water. When heated to a high temperature, these granules undergo a certain amount of transformation into soluble starch and dextrin. Boiling the starch in water has the same results. The action of the group of ferments known as diastases is to transform starch successively into soluble starch, dextrin, and finally maltose (malt sugar).

Uses as Food. Starch is seldom used pure in dietaries, but with other food principles in the form of various flours and bread made from them, or as breakfast cereals, legumes, potatoes, etc. The breads baked from wheat flour are among the most widely distributed foods.

Other Polysaccharides. Aside from starch and sugar the polysaccharides contribute but little to dietetic uses. *Cellulose,* the framework of plants, constitutes the largest proportion of their bulk. It is the principal part of the so-called "indigestible residue" of digestion; and hence the amount of the residue varies greatly with the nature of the food eaten. Without nutritive value, it is still believed to be of service as a stimulant to intestinal peristalsis, by acting as a gentle mechanical irritant; by helping to retain moisture and keep the feces soft; and by giving such bulk that the intestinal muscles can act to good advantage. When attacked by bacteria, it forms acids which are valuable checks to in-

testinal putrefaction. Unless it is desirable for some special reason to relieve the digestive tract of all work, a certain amount of cellulose should be included in the diet. In constipation the addition of some non-irritating form, as agar-agar has proved a successful therapeutic measure.

Gums, taken incidentally into the body, represent little or no nutritive value, and like cellulose act as "ballast."

Principles of Cooking Starch. The principles involved in the cooking of starch are of two types — chemical and mechanical.

Chemical Principles. Since raw starch is digestible only to a slight degree, it is essential to perfect digestion that starchy foods be cooked.

In the presence of moisture, starch is made soluble at the temperature of boiling water, i. e., 212° F. By long boiling, this soluble starch can be converted into dextrin, a still more easily digested form than soluble starch. This principle is applied in the making of gruels, especially for invalids and infants.

By dry heat, at a temperature considerably above 212° F. (300° F.–400° F.) starch can be converted quite readily to dextrin. This principle is applied in making toast. Some of the starch is further changed to caramel, giving a characteristic flavor to the crust of bread, toast, etc.

Mechanical Principles. When foods composed almost entirely of pure starch, such as flour, cornstarch, etc., are to be cooked with a liquid, care must be taken to prevent the formation of lumps, for these are not only unsightly, but consist of an outer layer of soluble starch surrounding a center of unchanged material and preventing its being made digestible.

There are three methods of avoiding lumps: —

1. By mixing the starch gradually with a small portion of cold water, so that a smooth fluid mass is formed, before adding the boiling liquid. This method is useful in making gruels, etc.

2. By mixing with fat before adding liquid. The melting fat separates the starch granules. At least as much fat as starch must be used. The liquid is preferably added cold, and all at once. If added hot, it must be stirred in very gradually. This method is employed in making gravies, sauces, etc.
3. By mixing with sugar. The melting sugar serves to separate the starch grains. This is practicable only when the sugar is greater in amount than the starch, and the liquid must be added gradually. This method is applied in the case of desserts, such as cornstarch pudding.

When foods consisting of a mixture of starch and cellulose, as cereal breakfast foods, are to be cooked, it is necessary to soften and break up the cellulose to enable the digestive juices to reach the starch. This necessitates long cooking at a temperature near the boiling point. The longer such a cereal product is cooked, the easier of digestion it becomes. Hence it is an excellent rule to cook such foods for infants and others of feeble digestive powers, twice as long as is commonly recommended.

Reheating of starchy foods, therefore, tends to increase their digestibility. Zwieback (or twice-baked bread) is more digestible, for example, than fresh bread.

Test for Starch. Starch is colored blue by iodin. Hence it is easy to detect its presence in any food. To make the test, a small portion of the material should be placed in a test tube, boiled with a little water, cooled, and two or three drops of dilute tincture of iodin added. If starch is present, the blue color will immediately appear. Dextrin gives a port-wine color with iodin, so that if any of this substance be present, the color is modified, becoming more or less purplish, or purple-red.

FATS AND OILS

Definition. Fats are food-stuffs having the same ultimate chemical composition as carbohydrates; i. e., consisting of

carbon, hydrogen and oxygen, but the latter element is present in less proportion than in carbohydrates. Fats were formerly spoken of as hydrocarbons, but this term is now reserved for substances which contain no oxygen at all, such as benzine.

Description. True fats, whether solid or oily, are chemically compounds of fatty acids with glycerine, and differ among themselves according to the particular fatty acids they contain. These commonly comprise stearic, palmitic and oleic acids. The stearates or combinations of stearic acid with glycerine (also generally spoken of as stearins) are solid fats as are also palmitates or palmitins. The oleates or oleins on the other hand are fluid at ordinary temperatures. It is therefore evident that solid fats contain much more stearin or palmitin than olein, while fat oils consist chiefly of olein. Stearin is found only in fat of animal origin. Animal fats are therefore a mixture of all three classes, while vegetable fats consist of mixtures of palmitins and oleins. Suet and tallow owe their firmness largely to the amount of stearin present, while lard owes its softness to the amount of olein present. Butter consists largely of palmitin. The most prominent of the animal fats are butter, cream, lard, suet, tallow, butterine, oleomargarine and cod-liver oil. The vegetable oils are obtained from fruits and nuts (olive, cottonseed, peanut, cocoanut, cocoa bean and almond). Vegetable oils and the liver oil of fish are composed chiefly of olein. Certain dietetic substances not usually thought of as fatty, contain much oil. Some of these are yolks of eggs, Indian corn and nearly all nuts except chestnuts. Artificial products like butterine are described elsewhere. They are often preferred to butter because their melting point is lowered by the addition of suet or tallow (beef-drippings) so that they keep better in warm weather.

Lecithin is a substance usually classed with fats and oils. Besides fatty acids it contains phosphorus. It is a necessary constituent of every living cell and is especially plentiful in the nervous tissues. At present it is used to a considerable

extent in medicine in the belief that it is of value as a food-drug and reconstituent. It is prepared from the yolk of egg and from brain substance. Feeding yolks of eggs is usually as advantageous and cheaper.

Volatile Oils. These, as already stated, have little in common with true oils. They stain paper only *temporarily,* while a fat stain is *permanent.* They vary much among themselves in composition and agree chiefly in their tendency to disappear by evaporation; and their odor, taste and pungency. A few of them are used in diet for flavoring. The oil of bergamot is obtained from orange peel, oil of lemon from lemon peel, etc. Cooking tends to volatilize them, so that such flavoring should be added at the last moment.

Sources of Fat in the Diet. The chief sources of fat in the diet are milk (yielding cream and butter), olive oil, meat fats (especially lard, bacon and salt pork, beef suet and drippings), and oily nuts.

Cheap Forms of Fat. Butter, cream, olive oil, lard, etc., are all subject to adulteration with cheaper fats, but aside from the fraud in charging a high price there is a legitimate industry for making cheaper products representing these articles. Thus skim milk has its lost cream restored by a homogenized meat fat containing some butter. A substitute for butter is produced from animal fats and sold under special names, etc. A substitute for lard with a higher melting point is made from cottonseed oil. The industry is yet in its infancy, although half a century old. The more expensive fats are prized for their flavor, but the cheaper fats carefully refined have also a high nutritive value.

Function. Fats are burned up in the body and produce energy in the form of work or heat. According to Dr. W. Gilman Thompson, the chief uses of fats are as follows:

1. To furnish energy for the development of heat.
2. To supply force.
3. To serve as covering and protection in the body.
4. To make more plastic various structures of the body and give rotundity to the form.

5. To spare the tissues from disintegration; for, although their combustion in the body results largely in the production of heat, they also take to some extent in tissue formation.
6. To serve for storage of energy.

Source of Body Fat. Twenty per cent. of the normal weight of man is fat. It is derived mainly from fatty foods and carbohydrates. Proteins are transformed into fat only to a very limited degree. It is most readily produced from carbohydrates, or a mixture of carbohydrates and fats.

Principles of Cooking. Fats are more digestible cold than hot, because hot fat tends to coat and intimately penetrate the food with which it is cooked or eaten, and as this coating is not dissolved by the digestive juices of the mouth or stomach, little or no digestion of carbohydrate and protein can take place in either of these places under such circumstances. Heating fat to a high temperature also changes its chemical nature, often producing irritating substances which interfere with digestion. For such reasons fried food should never be given to invalids.

Digestibility. The majority of fats are not very easily digested, consequently are not tolerated by those suffering from indigestion or by patients acutely ill; their use should be limited to finely divided forms, as in milk or yolk of egg; it is sometimes even necessary to reduce the fat in milk by skimming off the cream, or to limit the amount of yolk of egg, inasmuch as 30 per cent. of the yolk is fat. Other forms of fat valuable in the invalid's dietary are butter, cod-liver oil, and fat bacon cooked crisp. All fats, except limited quantities of butter and cream, should be forbidden in acute diseases of the stomach, intestines and liver, and in most of the chronic affections. Their use should be limited also in the presence of gall stones.

Fatty foods should be prescribed for children with rickets and for all who have diabetes. In the latter disease they partly replace the carbohydrates which cannot be used. Fat may be prescribed with benefit in chronic wasting disease, such as tuberculosis, and during convalescence from severe

acute disease. The most agreeable and digestible forms should be given. At first a small portion only should be taken, and the quantity increased in proportion to a patient's willingness to accept it. In a general way fats and oils are laxative; consequently useful in case of constipation and equally harmful where there is a tendency to diarrhœa.

Comparative Value of Fat and Carbohydrates as Fuel Foods. Fats and carbohydrates serve the same purpose in the body, in that they furnish energy. Fats are not as easily digested as carbohydrates, but weight for weight they furnish two and one-fourth times as much energy.

Tests for Fats. Fats are readily tested with paper; if they are present in a given substance a permanent grease-spot appears. If to a suspected substance a little solution of caustic soda is added a white precipitate forms, representing a hard soda soap.

WATER

Composition and Properties. Water is a compound of hydrogen and oxygen, consisting of two parts by volume of hydrogen to one of oxygen. Absolutely pure water is colorless, odorless, and tasteless, but such water is not found in nature, owing to its great solvent power, which causes it to dissolve substances with which it comes in contact. Water ordinarily, therefore, contains varying quantities of mineral and organic matter, including gases. To these substances in solution the characteristic flavor is due. Water from which the air has been expelled by long standing in a warm place, or by boiling, has a "flat" taste.

Water freezes at 32° F. On heating, the ice melts, and we may have ice water with a temperature of 32° F. When this water is warmed, the air dissolved in it begins to expand, and tiny bubbles appear, forming first on the sides of the vessel, and tending to rise to the surface. If the water there is not yet warmed, they contract and sink, but finally when the water is warm throughout, come to the surface and escape. After the air is thus expelled, if heating is continued,

steam bubbles form in a similar manner. At 185° F., water bubbles below the surface, or *simmers*. When the bubbles reach the surface and break, giving off a cloud of steam, the *boiling point* has been reached, 212° F. Except under pressure, water can then become no hotter. Fast boiling simply means rapid evaporations and waste of fuel.

Source of Water as Food. A considerable source of water is food itself. In green vegetables and fruits it constitutes as high as 85 to 95 per cent. of the whole substance; in potatoes and other starchy vegetables it is present in as large amount as 75 per cent. Even in seemingly dry foods, as crackers, there may be as much as 5 to 10 per cent. But since 60 per cent. of the body itself is composed of water, and water loss through the lungs, skin, kidneys, etc., is very constant, the supply in ordinary diet is not sufficient, and water must be added as a beverage. This may be in the form of ordinary drinking water, of tea, coffee, or other similar beverages and of medicinal waters; the latter, however, should be considered chiefly under the head of drugs.

Functions of Water in the Body. Water undergoes no chemical change in the body, yet the consideration of it is of vital importance. Solution is an essential part of digestion. Water bathes the tissues and washes away our waste and excrementitious matter. As it does not itself undergo any chemical alteration it is not susceptible of liberating force, consequently is not an energy-producing agent, but contributes to chemical changes by supplying a necessary condition for their occurrence.

Dr. Gilman Thompson summarizes the uses of water in the body as follows:

1. It enters into the chemical combination of the tissues.
2. It forms the chief ingredient of all the fluids of the body and maintains their proper degree of dilution.
3. By moistening various surfaces of the body, such as the mucous and serous membranes, it prevents friction and the uncomfortable symptoms which might result from their drying.
4. It furnishes in the blood and lymph a fluid medium by which

food may be taken to remote parts of the body and the waste material removed, thus promoting rapid tissue changes.

5. It serves as a distributor of body heat.

6. It regulates the body temperature by the physical processes of absorption and evaporation.

Professional fasters have shown that one may live for weeks without food, but it may readily be demonstrated that a warm-blooded animal except in a state of hibernation or trance can subsist but a few days without water.

Food Uses of Water. Water taken in considerable quantities with meals favors upward metabolism and increases the utilization of food. Thirst at meals does not always mean a true body demand for water, as it may be due to condiments, or to improper mastication of food. Under ordinary circumstances, about three or four pints daily are necessary to make up loss of water that is constantly being eliminated through the skin, kidneys, lungs and intestines. The quantity excreted daily varies greatly under special conditions. The demand for water is much increased by hot weather, and violent exercise, and diminished in the bedridden and sedentary. Babies, delirious patients, etc., should be fed water, as carefully as other food.

Classification of Varieties of Drinking Waters. The classification of water as food is based chiefly on its purity and palatability.

Hard and Soft Water. Water containing calcium (lime) or magnesium salts is known as hard water; and if it contains these salts in excess it is unsuited not only for drinking but for cooking and bathing, unless purified or softened. As only the carbonates can be expelled from the water, the purification is incomplete; chlorides and sulphates remain behind. For washing purposes the carbonate of lime may be precipitated by treating with lye, whereupon it rises to the surface and can be skimmed off. By adding soda to cooking water, a similar softening is obtained desirable in cooking vegetables, as they are toughened by the lime and sodium chloride. Finally, for drinking purposes hard water may be subjected

to prolonged boiling and straining; by this means the carbonic acid is driven off and the lime is set free. It must be remembered that a water not suited for domestic uses may still be fit for drinking if not taken in great excess, because lime and magnesium are natural ingredients of the body.

In *soft water* only a small amount of salts are found and as a rule it is more desirable to use for cooking purposes, especially in the cooking of legumes or when the object is to extract the nourishment or flavor of food, as in making tea or soup, etc.

Rain water is naturally pure but devoid of any mineral content, which is sometimes a disadvantage. It is not very palatable. It should be remembered that the first part of a rain fall carries down with it dust and impurities from the air, but the latter part of a shower furnishes as pure water as can be found from any source.

Spring Water, well water, etc., vary greatly in the amount of mineral matter, organic matter, gases, etc., present. In many cases the mineral content or gas content is such as to confer a medicinal value. In other cases the mineral matter is a menace to health. In most ground-water there is organic matter which besides being undesirable in itself invites the presence of germs, which often threaten the health and safety of whole communities. Great care should be taken as to the location of a well; deep spring water and water from artesian wells is usually pure. City water is usually filtered through sand beds and otherwise purified; the law requires such waters to be frequently analyzed as to purity.

As water may dissolve the lead from pipes through which it flows, it should be allowed to run several minutes before using if it has not been recently run off (as after standing over night) to avoid the risk of lead poisoning.

Filtered Water is water freed from organic matter of all kinds. It should be pure and palatable. But filtered water as a rule cannot be depended upon for purity owing to the fact that the domestic filters require constant cleansing and

serve to condense the impure organic matter which putrefies upon the filter and renders the water passed through them fouler in place of purer. Small filters screwed on faucets are of no value whatever. There are charcoal and porcelain filters on the market that are very good, but are not effective unless often and thoroughly cleansed. When there is the least doubt as to the purity of water it is best to boil it.

Boiled Water. Water simply sterilized by boiling and kept in bottles in a cool place is extensively used when there is suspicion as to its purity. It is rather unpalatable. Boiling renders harmless all the organic impurities and precipitates salts of lime. It must always be borne in mind that typhoid fever, cholera, dysentery and other pestilences are largely water-borne diseases, and whenever there is any suspicion that water is contaminated, the most available method for purification is boiling. Before filling the bottles, have them thoroughly cleansed and rinse with boiling hot water, as a few drops of unboiled water would be sufficient to contaminate the whole. To prevent breaking, place bottles in pan of warm water before pouring in the boiling water.

Distilled Water. This is water in its purest state. It is said by many authorities to be unsuited for a beverage because of total absence of mineral matter and gases, on account of which mineral matter is greedily abstracted from the walls of the stomach, thereby causing congestion and irritation. It is generally used for medicinal and chemical purposes. If employed as a beverage it should be aerated to improve the flavor.

Carbonated Waters. Ordinary water may be artificially charged with carbon dioxid, as soda water, etc. Among the most common carbonated waters (naturally charged) are Vichy, White Rock Water and Seltzer (effervescing waters) and Poland water (uneffervescing). These are valuable in case of fever and to tempt people to drink more water; also in relieving nausea and vomiting. They are used to advantage with acid drinks and to dilute alcoholic liquors. Carbonated

water of any kind should not be taken in excess, as such waters are apt to produce indigestion, by retarding the action of the gastric juice.

Alkaline Mineral Waters are carbonated (naturally charged) and differ from ordinary water in the greater amount of gaseous (carbon dioxid and sulphuretted hydrogen) and solid matter (sodium chloride, potassium, magnesium, iron, sulphur, etc., etc.), which they contain. Some mineral waters have no medicinal value and are simply used for quenching thirst; others have purgative, laxative or diuretic effect. The following are a few examples of the latter class — Sulphur Spring, Saratoga, Vichy, Hunyadi, Londonderry, and Lithia Waters.

The benefit derived from the water cures so often prescribed is not usually from the water itself but from the change, treatment and quantity of water taken. Much benefit can be derived by following the same treatment at home.

Temperature of Drinking Water. Luke-warm or tepid water (65° to 92° F.) which in theory should be most suited for drinking is insipid and even repugnant to most people. Hence as a beverage water is either taken warm (92° to 100° F.), hot (100° F. and over), cool (65° to 92° F.) or cold (32° to 65° F.). The taking of hot water in large quantities has been found of benefit for weak digestions and in much chronic invalidism. It acts as a stimulant to gastric digestion; relieves thirst more quickly than cold water; is more quickly absorbed, and leaves the stomach sooner. Cool water is the normal beverage for quenching thirst. Ice water is unsuitable for all individuals when overheated, and with meals for dyspeptics and those in delicate health. Fever patients, however, may take it ad libitum; for most robust individuals who crave it with or without meals it seems to do no great harm, if taken slowly and in moderation. Its coldness acts as a natural check against overindulgence. It probably slows the movements of the stomach and as long as the stomach is chilled the action of the pepsin is curtailed since this acts best near

blood temperature, but the arrest is only temporary. A small quantity of crushed ice is known to relieve nausea.

MINERAL MATTER

Function. The mineral matter in the body serves the most varied ends. It gives solidity to the bones and teeth; its presence in body fluids, such as blood and lymph, imparts to them a certain degree of concentration which is absolutely necessary to the vital processes. Again, minute quantities of mineral matter are invariably present in living cells and are indispensable to their existence. The kind of mineral matter in a given tissue or organ varies according to its function. The bones and teeth owe their stability to salts of calcium (lime) and magnesium, especially the phosphates. The salts which are necessary for the regulation of the body fluids comprise potassium, sodium, calcium and magnesium, especially in the form of chlorides. The substances essential to the active cells as part of their normal structure comprise phosphorus, iron, and sulphur, in the form of organic compounds, along with other salts in small quantities. Phosphorus is found in the nuclei of all cells and is essential for growth. The red corpuscles are rich in iron, and the thyroid gland cells contain considerable iodin. Nearly all cells have traces of sulphur, mainly in the form of protein.

Amount and Kind of Mineral Matter in the Organism. The mineral matter in the body amounts to about 5 or 6 per cent. by weight, occurring chiefly in the bones. The elements needed in the body can all be found in food.

The chemical elements found in the body comprise hydrogen, oxygen, nitrogen, carbon, phosphorus, sulphur, silicon, fluorin, chlorin, iodin, all of the non-metal type; while of the metals are present sodium, potassium, calcium, magnesium, iron. Traces of manganese, aluminium, possibly also arsenic, are sometimes found. Any substance which exists in the soil may find its way into the body.

There is more calcium (lime) in the body than any other of the metals, while phosphorus exists to a greater extent than any other non-metallic element, exclusive of those which go to form living matter. These elements predominate thus because the bones contain so large an amount of phosphate of lime. Lime is also present to a considerable extent as carbonate. Magnesium phosphate comes next in amount. With the exception of these three bone compounds, mineral matter is present in relatively small quantities.

The sodium and chlorin occur chiefly in the form of sodium chlorid, which is present in all the fluids and solids. The chlorin of hydrochloric acid of the gastric juice comes from the sodium chlorid. Some sodium is also present as carbonate and phosphate, and these two are found in sufficient amount to give the blood and numerous fluids and secretions a neutral reaction. Potassium occurs mainly in the form of potassium phosphate. Muscle-tissue is rich in this salt.

The sulphur and phosphorus which enter the body in the form of protein in animal food are oxidized to sulphuric and phosphoric acids and these at once combine with bases to form sulphates and phosphates of lime, sodium, etc. Sulphates occur to a slight extent only, while as already stated phosphates are the most important constituents numerically.

Source of Mineral Matter in the Food. The mineral matter received into the body comes either from the solid food or dietetic fluids. With the exception of sodium chlorid (common salt) it is not usually added to the diet. Such additions, however, are often prescribed as medicine in states of ill health. Thus phosphates and hypophosphites of lime, sodium and potassium are used largely in rickets and scrofula. Iron is given for impoverished blood. It is better to give them in the form of food as far as possible, and care should be taken to see that the food is rich in the mineral elements needed even if they are at the same time being given in inorganic form, for the body can use food salts in many instances to much greater advantage.

Animal food in general contains the same mineral con-

stituents that are found in corresponding human tissues.

Cow's milk is rich in calcium and phosphorus in organic forms, and contains small amounts of sodium, potassium, magnesium, iron and chlorin.

Eggs contain iron and phosphorus in their most assimilable forms, especially in the yolks.

Meats are lacking in calcium, and while red meats are comparatively rich in iron, it is not in as available form as in eggs.

Since the animals used by us as food obtain their mineral matter from plants, the richest and most varied supply is commonly found in the vegetable kingdom. Calcium is abundant, especially in such vegetables as beans and peas, fresh or dried, in other green vegetables, in fruits and the outer parts of grains. There is little in polished rice or fine flour.

Vegetable foods are rich in potassium, which usually occurs in the form of potassium phosphates. Spinach is richer in iron than almost any other plant food; whole wheat, oatmeal, peas and beans, raisins and prunes are also valuable sources of organic iron.

Vegetable Acids and their Salts. Some authorities consider these substances under the head of mineral matter, although they have an organic origin and do not pre-exist in the soil. They comprise the acids of juicy fruits such as the citric acid of the citrus group, the malic acid of apples, pears, etc., and the tartaric acid of grapes. They exist partly in a state of combination with sodium and potassium. From a dietetic standpoint they may be placed in the same category as the carbonic acid gas and alkaline carbonates of the diet, because in the body they quickly become changed to carbonates, and assist in the maintenance of the proper reaction of the blood. Various diseases are believed to be due to an excess of acid in the body, or what is the same thing, to a diminution of alkali. There is no doubt that acid fruits and vegetables are valuable in counteracting such a condition.

Importance of a Proper Supply of Mineral Matter. It

was formerly thought that since mineral matter is universally present in food and drink, an individual need pay little attention to this phase of the feeding problem. Before the paths of elimination of ash constituents had been studied with any care, it was assumed that many such compounds were excreted in the feces without having ever been absorbed. Since more light has been thrown on the fact that the intestines form the regular path of excretion of certain mineral matter, and on the chemical nature of the regulation of body processes, there has been greater realization of the fact that unless a diet is chosen from a wide range of food materials, these is danger of some of these constituents being supplied in too small quantities or not at all. This is especially true in the case of artificially-fed infants and of growing children, whose demand for building material is large, but it is not negligible even in adults, especially for the proper control of the body processes. If care is taken to provide iron, phosphorus and calcium in organic forms, there is little danger of inadequate supply of the inorganic salts, since these are present in the milk, eggs, green vegetables and fruits which best supply the elements mentioned above.

Use of Mineral Matter in Disease. Continued deprivation of sodium chlorid (common salt) will finally lead to lowered secretion of hydrochloric acid in the gastric juice, but there are certain diseased conditions in which withholding of salt is beneficial. Salt tends to hold water in the body, and where the heart is weak, and it is desirable to lessen the volume of blood to be pumped, a salt-free diet may be desirable. In some forms of edema and in Bright's disease the practice is also followed. Epileptics who depend upon bromides to prevent their fits can do with much less of these substances if their salt is cut down, because bromin up to a certain extent displaces the chlorin in such compounds as sodium chlorid, and fails to fulfill its purpose in such a case.

It is common to find statements that certain serious disorders like calculus disease, rickets, scurvy, tuberculosis, etc., are due primarily to too much or too little of some mineral;

but, as already stated, the real causes must lie deeper, although the possibility of such factors must never be underrated. Scurvy was once held to be due to too much salt, used as preservatives; later it was regarded as due less to excess of some salts than absence of others, as potassium. To-day we believe it is due to something provided by fresh food, but destroyed sometimes by drying and sometimes by cooking. With a more liberal dietary, including fresh vegetables and fruits, it disappears.

Beriberi, a disease produced by a dietary composed largely of polished rice, has been shown to be due to the absence of minute quantities of a complex organic compound present in the rice bran. Addition of this to a polished rice diet will effect a cure. Students of nutrition are looking for other substances of this class, in other foods. It has been shown that butter fat contains something necessary to the growth of young animals (white rats) which is found also in cod liver oil, but not in lard. The term vitamine is proposed for these as yet little known but evidently important substances.

Children with rickets often improve on preparations containing lime and sodium, as also do scrofulous children, but it is difficult to show that in such cases the remedies act by supplying any one kind of mineral food. The safe way is to supply foods containing all, unless one has positive knowledge of the value of some specific element.

FOOD ACCESSORIES OR ADJUNCTS

CONDIMENTS — BEVERAGES

CONDIMENTS

Condiments are substances not necessarily possessing nutritive value, which are used to give sapidity to tasteless or unappetizing dishes. To what extent they have any specific action on the functions of the body is not clear. They tend to increase the flow of saliva and gastric juice and thus in theory favor the digestion of starch.

Classification. The number of condiments, if we include

appetizing substances of all kinds, is very large. In some countries olives, a bit of dried herring, in fact, anything possessing pungency, may be served before a regular meal.

Sauces perhaps represent the largest class of condiments and the great number and variety of their ingredients give us some idea of the number of individual condiments. They are added to food while eating.

Spices (ginger, cinnamon, nutmeg and cloves) are used only in cooking. In this same category may be placed flavoring extracts.

Mustard is used both in preparing food and as an accessory while eating. Horseradish belongs in the same class. The flavor of these depends on a volatile oil peculiar to each substance. Such oils have no value as foods. Pepper, salt and vinegar form the most indispensable of table condiments. Of these, salt is, strictly speaking, a food. When, however, it is used in excess of body needs, simply to modify the flavor of food, it is properly classed as a condiment.

Condiments are taken for their mild stimulating effects on the tissues with which they come in contact. They are not required by a normal appetite, but are frequently used to obscure the flavor of poorly prepared food. Just as bread can be made of so delicate a flavor that it can be eaten without butter, most other foods can be so treated as to have a sufficient sapidity. In the Northern States, tomatoes and melons are eaten with various accessories; in some parts of the South such fruits have so delicious a flavor that they are eaten plain. To add a cheap table sauce to a costly steak seems a gastronomic sin and certainly has no physiological justification.

In short, the taste for condiments is largely an artificial one, and their use should be limited. A well-trained palate tires of these high seasonings more quickly than of the mild characteristic flavors of food perfect in its natural state or so cooked as to develop its inherent taste. The moderate use of condiments occasionally, for the sake of variety, or when the appetite is feeble, may be legitimate. They should be withheld (with the exception of salt), from the food of chil-

dren, both because they destroy the appetite for milder foods, and because they are irritating to the mucous membrane of the alimentary canal. Because of their irritant properties they should also be given with caution to invalids, especially those suffering from any inflammation of the digestive tract.

BEVERAGES

These food accessories comprise milk, coffee, tea, cocoa and chocolate, alcoholic drinks, lemonade and other acid drinks, aerated and carbonated drinks. Milk is a food rather than a beverage, becoming a solid instead of a liquid food in the stomach. It is the only product in nature provided solely for food. It contains not only protein, fat, and carbohydrates in good proportions, but also a rich supply of mineral salts in an available form. Growing children should have at least a quart of milk every day. Cocoa and chocolate are also valuable for their content of protein, fat, and carbohydrate, and drinks from fruit juices contain mineral salts, organic acids (which help to maintain the neutrality of the blood), and some carbohydrate. In other cases, the value of beverages does not lie in their nutritive content.

Stimulation. Coffee, tea, chocolate and cocoa contain a stimulating alkaloid which produces mild exhilaration without reaction. Alcoholic drinks while they tend to produce narcotic effects when taken in excess, act as stimulants and appetizers in small quantities.

Thirst Quenching. Substances like lemonade, ginger ale, and aerated drinks in general use are used for this purpose.

Sapidity. Coffee and its congeners are used largely for their delicate flavor, and this may be said to a certain degree of all beverages. Drinks especially designed for the invalid and the sick will be considered under other heads.

CHAPTER II

NUTRITION

DIGESTION — ABSORPTION — METABOLISM

Under this term is usually understood the digestion and absorption of nourishment, its assimilation and utilization, its storage in excess, and finally the elimination of the products of wear and tear, of combustion, and of nutriment or waste which cannot be utilized. Those processes of nutrition which occur after absorption are now included in the term metabolism. To restate this in a simple form (adapted from Thompson), nutrition involves:

1. The secretion of digestive fluids, and their action upon food in the alimentary canal — in other words, digestion.
2. The passage of the ingredients of the digested food into the blood vessels and lymphathic vessels — absorption.
3. The utilization of the absorbed nutrition products by the cells — assimilation or upward metabolism.
4. The elimination of waste material — disassimilation or downward metabolism.

The subjects of digestion and absorption will be treated in detail for each food principle, and then summarized at the end of each topic.

DIGESTION

DIGESTION OF PROTEINS

Digestion in the Stomach. Protein is not chemically altered in the mouth. The process of chewing simply moistens and divides it into small particles so that it is easily swallowed and more readily attacked by the secretion of the stomach. Passing down the œsophagus, through the cardiac

sphincter guarding the entrance to the stomach, it enters that portion of the latter organ called the *fundus.* Here it rests quietly for some time, so that it is not immediately mixed with gastric juice, as formerly taught, but the outer portions of the mass are successively attacked and dissolved. These soft portions are then pressed into the intermediate and pyloric regions of the stomach and subjected to a thorough mixing.

The *gastric juice* is an acid fluid which may be secreted in large quantities — as much as one or two gallons in 24 hours. Its acidity is due to the presence of about 0.2 per cent. to 0.4 per cent. of hydrochloric acid. This of itself is capable; of causing protein to swell and to some extent dissolve; of hydrolyzing the collagen of connective tissue; of decalcifying bone; and of preventing bacterial action.

The gastric juice contains two enzymes which act on protein, *pepsin* and *rennin.* Pepsin can act only in the presence of a definite percentage of hydrochloric acid, while rennin acts in a neutral solution. The relations of rennin and pepsin are not yet very clearly understood. The function of rennin is to curdle milk, which causes it to remain in the stomach long enough to be digested by the pepsin.

Action of Pepsin. The protein of the diet, more or less swollen, softened, and dissolved by the action of hydrochloric acid, is changed chemically by pepsin, into a series of increasingly simpler and more soluble products, namely, *acid proteins, proteoses* (often called albumoses) and *peptones.* The change to peptones is not complete, but these three products of peptic digestion tend to pass together into the intestine, when the pyloric sphincter which guards the entrance to the duodenum opens to let them pass. The opening and closing of this sphincter is controlled by two factors: 1. The consistency of the partly digested food, solid particles tending to keep the pylorus closed. 2. The presence of free hydrochloric acid in the stomach contents. This is the more important factor.

Protein is capable of absorbing and uniting chemically with

a certain amount of acid. When it is so saturated, free acid will be present, having now nothing with which to combine, and this free acid is the stimulus which causes the pyloric sphincter to relax and lets a little spurt of food into the duodenum. Once in the duodenum, this same acid acts as the stimulus to close the pylorus, and no more food enters the duodenum until the first portion has been neutralized.

A clear understanding of the way in which the pyloric sphincter is regulated throws considerable light on stomach digestion. We can understand why a certain quantity of indigestible residue, such as is present in most of our staple foods — meats, vegetables, fruits, etc.— is of service in retaining food within the stomach for a time, giving the hydrochloric acid a chance to exercise its bactericidal power, and favoring thorough gastric digestion. It also explains why a meal of "bolted" food (or of food imperfectly masticated through absence of teeth), or a failure of free hydrochloric acid in the stomach contents, as in hypoacidity or achylia gastrica, may set up such a continuous state of pyloric contraction that the stomach remains unemptied for a long period, with a good prospect of fermentation and gas production, of relief by vomiting, or of an attack of acute indigestion, biliousness or diarrhœa. The nurse will understand why a diet of "liquids" for a person in relatively good health does not prove satisfactory. Liquids do not stay long enough in the stomach to give a sense of fullness, give the stomach little to do, and tend to pass into the intestine poorly prepared for the action of the digestive juices there.

Digestion in the Intestines. On entering the duodenum, the acid chyme from the stomach meets three secretions, all alkaline in reaction, namely, the *pancreatic juice,* the *bile,* and the *intestinal juice.*

The hydrochloric acid of the stomach is indirectly responsible for the flow of the pancreatic juice, for this begins only after acid food has entered the duodenum. The pancreatic juice contains an enzyme capable of digesting protein only after it has come into contact with the intestinal juice. This

enzyme is then called trypsin, and the changes which it produces in protein are similar to those produced by pepsin; it acts, however, in an *alkaline* medium.

The products of tryptic digestion are therefore *alkali protein, proteoses* (albümoses) and *peptones.*

The bile plays no significant part in protein digestion, except as it helps to neutralize the chyme.

The intestinal juice contains an enzyme called *erepsin,* which completes the digestion of protein, breaking down the proteoses and peptones formed by pepsin and trypsin into still less complex compounds called *amino acids.* These are the "end-products" of protein digestion. The digestive process can go no farther. There are no enzymes acting on proteins in the large intestines.

Summary. The chemical changes in protein during the process of digestion are shown in the following table:

PART OF ALIMENTARY TRACT	NAME OF SECRETION	ENZYMES ACTING ON PROTEIN	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	None	None
Stomach	Gastric Juice	Rennin	Coagulates milk
		Pepsin and Hydrochloric acid	Acid Protein, Proteoses, Peptones
Small Intestine	Pancreatic Juice	Trypsin (in alkaline medium)	Alkali Protein, Proteoses, Peptones
	Bile	None	None
	Intestinal Juice	Erepsin (acts only on proteoses and peptones)	Amino Acids

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DIGESTION OF FAT

Fat is not acted upon by the secretions of the mouth nor to any great extent by those of the stomach. The gastric juice contains an enzyme, called *gastric lipase,* which has the power of acting on emulsified fats, such as in cream or yolk of eggs. It plays a more important part in the digestion of infants than of adults.

The presence of fat in the stomach retards the secretion of gastric juice. Hence a certain excess of fat in the stomach is sufficient to close the pylorus for a longer or shorter time, due to the failure of the appearance of free hydrochloric acid. This doubtless accounts for the fact that fat in the diet often seems to retard and otherwise disturb digestion.

Digestion of fat takes place mainly in the small intestines. The pancreatic juice contains an enzyme called *steapsin,* which has the power of emulsifying fats and also of splitting them into fatty acids and glycerine.

The bile contains no such enzymes, but it is nevertheless an important factor in the digestion of fat. It has the power of increasing greatly the activity of the pancreatic lipase (steapsin), and of holding in solution the fatty acids formed by its action, so that they are more perfectly absorbed. When bile is lacking, much of the fat fails of absorption and is excreted through the intestines. Emulsification is an important aid in the splitting of fat into fatty acids and glycerine, the forms in which fat is chiefly absorbed.

DIGESTION OF CARBOHYDRATES

1. *Digestion of Starch.* There is little doubt that primitive man accomplished much of the digestion of starch in the mouth. The saliva contains two enzymes, *ptyalin,* and *maltase.* By the action of ptyalin starch is changed to dextrins and these to maltose; by the action of maltase, maltose is converted into dextrose, the end-product of salivary digestion. The crude uncooked food required prolonged mastication before it could be swallowed, and during this mastication the enzymes had opportunity for action. Raw starch is so very

slowly affected by enzymes, that much of the food value of uncooked cereals is lost, so that the practice of baking ground grain into bread developed very early. This fact in regard to starch digestion is often disregarded by advocates of a return to raw foods.

There is said to be some evidence that a pharyngeal reflex once existed which prevented the bolting of foods which are capable of salivary digestion, or which are not easily digestible without mastication. In recent years, Mr. Horace Fletcher has counseled a return to prolonged mastication, in order that salivary digestion may be carried to its fullest extent. It is claimed that the more perfect utilization of all food eaten necessitates the taking of a smaller amount. There is no doubt that thorough mastication renders the digestion of starch easier and more complete, but it will not greatly alter the total food requirement.

The starchy food mixed with saliva passes from the mouth to the stomach and lodges in the fundus, the portions last eaten always going to the center of the mass. Thus, while the gastric juice is at work upon the outer layer, attacking the protein of the diet, the inner portions remain alkaline for a considerable time, so that salivary digestion may continue undisturbed.

From time to time, the soluble products of salivary and gastric digestion pass into the small intestine. Here the conversion of starch and intermediate products into simple sugars is completed. The pancreatic juice contains an enzyme called amylopsin, which acts like ptyalin, i. e., changes starch to dextrins, and finally to maltose.

The intestinal juice contains an enzyme capable of changing maltose to dextrose, the final product in starch digestion.

Summary. The chemical changes in starch during the process of digestion are shown in the following table: —

PART OF ALIMENTARY TRACT	OF NAME SECRETION	ENZYMES ACTING ON STARCH	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	Ptyalin	Dextrins, Maltose
		Maltase	Dextrose
Stomach	Gastric Juice	None	
Small Intestine	Pancreatic Juice	Amylopsin	Dextrins, Maltose
	Intestinal Juice	Maltase	Dextrose

2. *Digestion of Sugars.* Although sugars are perfectly soluble and easily absorbed, they must all be converted into monosaccharides or simple sugars (chiefly dextrose), before they can be utilized by the body. Hence we find a number of enzymes in the alimentary tract acting upon disaccharides. Two of these have already been indicated in discussing the digestion of starch, i. e., the maltases of the saliva and intestinal juice, which convert each molecule of maltose into two of dextrose. In the stomach, a slight hydrolysis of the disaccharides may occur through the influence of the hydrochloric acid. In the intestines, provision is made for their complete transformation. Both the pancreatic and intestinal juices contain enzymes of this type. In young animals, or older individuals on a milk diet, the pancreatic juice contains *lactase,* which converts lactose (milk sugar) into dextrose and galactose. The intestinal juice contains three such enzymes, *sucrase,* acting on sucrose (cane sugar); *lactase,* acting on lactose; and *maltase,* acting on maltose.

Summary. The chemical changes in sugar during the process of digestion are shown in the following table:

PART OF ALIMENTARY TRACT	NAME OF SECRETION	ENZYMES ACTING ON SUGARS	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	Maltase	Dextrose
Small Intestines	Pancreatic Juice	Lactase (at times)	Dextrose Galactose
	Intestinal Juice	Lactase	Dextrose Galactose
		Maltase	Dextrose
		Sucrase	Dextrose Levulose

Mineral Matter and *Water* require no changes to prepare them for absorption.

RESUMÉ OF DIGESTION

The processes of digestion are both *mechanical* and *chemical.* By mechanical processes the foods are first softened and finely divided, so as to be non-irritating to the walls of the alimentary tract, and to expose as much surface as possible to the action of the digestive enzymes; secondly, they are moved along the alimentary tract from time to time, to facilitate digestion and absorption, and to expel indigestible residues. The movements of the mouth in mastication, of the œsophagus in swallowing, and of the intermediate and pyloric regions of the stomach in mixing the food with the gastric juice; the rhythmic and peristaltic movements of the small intestines, by which the food is alternately churned in a stationary position and then pushed along to a new region to repeat the process; and finally, the anti-peristaltic movements of the first part of the large intestines and the slow peristalsis throughout its entire length, form a series of events of tremendous importance to the welfare of the organism.

By chemical processes, complex food-stuffs are converted into simpler substances out of which the body can build the

compounds essential to its persistence and activity. The digestive fluids and the enzymes contained therein, with the results of their activity, are most readily indicated by the following table:

PART OF ALIMENTARY TRACT	NAME OF SECRETION	REACTION TO LITMUS	ENZYMES PRESENT	FOODSTUFFS ACTED UPON	PRODUCTS OF ENZYME ACTION
Mouth	Saliva	Alkaline	Ptyalin	Starch	Soluble Starch-Dextrins Maltose
			Maltase	Maltose	Dextrose
Stomach	Gastric Juice	Acid (0.2%–0.4% H Cl.)	Pepsin	Proteins	Acid Protein Proteoses Peptones
			Rennin	Protein (especially casein of milk)	Coagulated Protein
			Lipase	Emulsified Fats	Fatty acids and glycerine
Small Intestines	Pancreatic Juice	Alkaline	Trypsin	Proteins	Alkali Protein Proteoses Peptones
			Steapsin	Fats	Emulsified Fat — Fatty acids and glycerine
			Amylopsin	Starch	Soluble Starch — Dextrins — Maltose
			Lactase (in young animals)	Lactose (Milk Sugar)	Dextrose and Galactose
	Intestinal Juice	Alkaline	Erepsin	Proteins in the form of Proteoses and Peptones	Amino Acids
			Sucrase	Sucrose	Dextrose and Levulose
			Maltase	Maltose	Dextrose
			Lactase	Lactose	Dextrose and Galactose

The bile contains no important enzymes, but greatly facilitates the digestion of fats. The intestinal juice contains an enzyme which makes trypsin an active enzyme, and a substance which helps to stimulate the flow of pancreatic juice.

Inspection of the table on page 44 shows that there are five so-called digestive juices, viz.: saliva, gastric juice, pancreatic juice, bile, and intestinal juice. All are produced intermittently except the bile, which is secreted continuously into the gall-bladder and discharged at intervals into the intestine. All are alkaline except the gastric juice. All contain powerful enzymes except the bile. Enzymes which digest protein occur in the gastric juice (pepsin), the pancreatic juice (trypsin), and the intestinal juice (erepsin). Ferments which transform starch to sugar occur especially in the saliva and pancreatic juices, and are commonly known as diastatic enzymes. Ptyalin is an old name for salivary diastase, amylopsin for pancreatic diastase.

The principal fat-splitting enzyme occurs in the pancreatic juice, and is known as pancreatic lipase or steapsin. Numerous enzymes of minor importance occur in the gastric, pancreatic, and intestinal juices. Bile in itself is able to emulsify fat as a step toward digestion.

FACTORS DETERMINING RATE OF DIGESTION

We know of the existence of many factors which influence salivary and gastric digestion, but much less about intestinal digestion. Among these are the nature of the food, cookery, appetite, mastication, palatability, mental state, amount of fluid in the meal, the pyloric reflexes, etc. The nature of the individual plays a powerful role; some individuals can subsist almost wholly upon one or a few articles, while others quickly revolt against monotony of diet. Idiosyncrasy is another important factor; for example, some individuals cannot eat mutton, however disguised, while in others sugar is so strong a stimulant to peristalsis that it sets up a violent diarrhœa. The above being true of presumably healthy people, the factors which may influence digestion in the sick, invalid and convalescent must be still more uncertain. Hence tables which purport to give the relative digestibility of foods must be studied with allowances. We can study this problem in test tubes, or by examining the washings from the

stomach after definite meals or in fistula patients, but the results can hardly be applied forthwith to all persons.

The direct stimuli to the secretion of saliva are the sight, odor or taste of food; or the mechanical irritation produced by contact of food-stuffs with the mouth. Indirectly, the thought of food may be a psychic stimulus to the flow of saliva. Excitement may so check the flow of saliva that it is impossible to swallow dry food.

The stimuli to the secretion of gastric juice are both psychic and chemical. Pawlow has demonstrated, in the case of dogs, that the sight of food or the chewing of food in the mouth may produce a very effective flow of gastric juice, to which he attributes great importance in digestion. How important this preliminary flow before food enters the stomach may be in the case of man has not been very clearly demonstrated, but it seems reasonable that the desire for eating, the act of eating and the pleasure obtained therefrom exercise a favorable influence upon gastric secretion. It has recently been shown that the products of salivary digestion act as a stimulus to the flow of gastric juice, and that once the process of gastric digestion is initiated, the products of peptic activity cause the continuance of the secretion as long as the food remains in the stomach. The mere mechanical irritation caused by the presence of food in the stomach is ineffective. Thus white of egg will cause no flow. But certain substances, such as meat extracts, bitters and condiments, promote secretion. The use of meat broths, gelatin jellies, peptones (i. e., products of gastric digestion), and toast (containing dextrins or products of salivary digestion), at the beginning of a meal, or to promote feeble gastric digestion in an invalid, is therefore a rational practice.

ABSORPTION

While absorption through a permeable animal membrane outside the body may be a simple physical process, following the ordinary laws of pressure, diffusion, osmosis, etc., the case

is far otherwise in the alimentary tract, where the selective activity of the living cell becomes a positive factor. The pressure in secreting glands rises above blood pressure; substances pass inward to the body through the mucous membrane without a corresponding movement in the opposite direction. Thus blood serum, placed in a loop of intestine is promptly absorbed, but if the loop be surrounded with serum, it does not pass in a similar manner into the lumen of the section of intestine.

The stomach is not primarily an absorbing organ, but a few substances, such as sugars and peptones, pass to a limited extent through its walls. The most important seat of absorption is the small intestine, and second, the large intestine. Absorption in the small intestine is affected through the innumerable little projections with which the intestine is lined, known as villi, which greatly extend the amount of surface. These villi contain a capillary network and a so-called lacteal space. The capillaries by converging into larger vessels eventually form the portal vein which passes through the liver. The lacteal spaces are prolonged into lymphatic vessels which similarly converge to form the thoracic duct. The lacteals are intended almost wholly for the absorption of the fats, all other digestive products passing through the liver before reaching the general circulation.

Absorption continues throughout the length of the large intestine, being especially favored by antiperistalsis in the upper portions. Constipation sometimes results from the great absorptive power of this region, the feces being left dry and hard and hence difficult to evacuate.

Absorption of Protein. It was long a matter of doubt as to the form in which proteins were absorbed, but there was a strong inclination to believe that they were transformed into protein before being transported by the blood, because it was almost impossible to detect amino acids in the blood or tissues. We now know that this was due to the imperfection of our chemical methods. It has recently been demonstrated by several independent investigators that amino acids are absorbed from the intestines, circulate in the blood, and pass

to the tissues, and that the cells of the body are able to take them up and use them according to their needs. Animals have been made to store protein when the only nitrogen supplied to the blood was in the form of amino acids.

Traces of protein, proteoses or peptones, may be absorbed from the stomach or intestines, but ordinarily the amount is negligible. Such products when present in the blood tend to pass quickly into the urine. The peculiar idiosyncrasy of poisoning from such foods as eggs, milk, fish, etc., is thought to be due to the influence of traces of absorbed proteins to which the subject shows an anaphylactic reaction.

Absorption of Fat. It is now commonly believed that fat is absorbed in the form of the end products of its digestion, i. e., fatty acids and glycerine, and that somewhere in the intestinal wall these are recombined into neutral fat. It is possible that some of the finely emulsified fat is able to pass unchanged through the intestinal wall. In either case, minute fat droplets pass into the lacteals, and finally into the blood stream by way of the thoracic duct. A small portion finds its way directly into the blood.

Fats having a low melting point are absorbed more quickly than solid fats, and pure fat more readily than fat intermingled with other food principles, as in fat meat.

Absorption of Carbohydrates. The end products of carbohydrate digestion pass to the blood by way of the portal system. The monosaccharides on reaching the liver enter the general circulation as dextrose if required for immediate use; otherwise they are stored in the liver in the form of glycogen, which can be again transformed into sugar when demanded by the system to furnish energy. Sugars are so readily absorbed that if taken in large quantities the body may be unable to utilize them, and the excess is excreted in the urine. This is especially true in case of an excess of cane sugar or milk sugar. They may be absorbed before digestion, and there are no enzymes in the blood capable of converting them into dextrose so that they can be burned or stored. Under such circumstances they are useless and must be gotten rid of. If maltose is absorbed too rapidly, it may still be changed to

dextrose by enzymes in the blood or tissues, and so be utilized.

Absorption of Mineral Matter. As salts are not digested in the ordinary sense of the word, they require nothing more than solution in the digestive fluids before absorption. The mineral matter is set free from food and diffuses more or less rapidly into the surrounding fluids. Common salt is most quickly absorbed. The chief locality for absorption is the small intestines. The older text books taught that salts were absorbed only by diffusion through the intestinal wall, which required that another solution must at the same time pass from the blood to the intestines until both fluids were of the same degree of concentration. It appears, however, that in the main, mineral matter is taken up in the intestinal wall without diffusion, and as fast as it can be incorporated with certain peculiar solvents is absorbed into the blood.

Absorption of Water. Water it not absorbed by the stomach, but passes quickly in little spurts (if taken alone) into the intestines. Here it is very rapidly absorbed; it may be excreted through the kidneys within twenty minutes after ingestion. The rapidity of absorption may be considerably influenced by mineral matter dissolved in the water.

Summary. Absorption is an active, not a passive process. It takes place mainly in the intestines, the larger part before the food reaches the ileo-cecal valve.

Proteins are absorbed by the villi, chiefly in the form of amino acids and pass through the portal vein to the liver.

Fats are absorbed by the lacteals, chiefly in the form of fatty acids and glycerine, but pass to the lymphatics as neutral fat, and enter the blood stream from the thoracic duct.

Carbohydrates are absorbed by the villi in the form of sugar (chiefly dextrose) and pass through the portal vein to the liver.

Unabsorbed material passes out as part of the feces (see Excretion, page 53). Undigested proteins, fats and carbohydrates are liable to attack by putrefactive and fermentative organisms in the intestines. The products of such bacterial action are absorbed to a considerable extent. Carbohydrates which escape digestion tend to produce lactic and

other acids. This fermentation is not altogether an evil, for it checks the putrefaction of undigested meat. The latter is undesirable, as the products are likely to prove toxic. It is for this reason that lactic acid, especially in the form of buttermilk and artificially fermented sour milk, is largely employed as a remedial agent in intestinal indigestion.

METABOLISM

Metabolism is the sum of the chemical changes taking place in the cells of the body in connection with all biological processes, including growth, repair and waste, generation and maintenance of heat, all manifestations of functional activity, storage of surplus nutriment, etc. It comprises two phases, anabolism and katabolism.

Anabolism embraces the changes involved in the upbuilding of the cells, and corresponds in a general way to nutrition. *Assimilation* is the selective act of the cells in appropriating the special form of nutriment in the circulating blood which is suited for their needs. The special phases of anabolism comprise the assimilation of nitrogen for growth and repair of protoplasm, the storage of a certain amount of fat and carbohydrate, the assimilation of oxygen for maintenance of heat and functional activity, and the retention of inorganic salts in the bones and other tissues.

Katabolism comprises the changes involved in the continuous molecular waste of the cells; in the constant oxidation going on in the tissues resulting in the maintenance of animal heat; in the exercise of muscular, nervous and secretory activity; and perhaps in the breaking up of protein into oxidizable carbohydrates and nitrogenous waste products. We speak less of the acts of katabolism than of the products of katabolism, which are a measure of those acts. The chief of these products are: (1) urea, the chief form of excretion of nitrogen, and (2) carbon dioxide and water, which represent the products of energy-yielding oxidations.

Elimination is the escape or expulsion of the products of

katabolism from the tissues into the blood, and corresponds to disassimilation or denutrition. Excretion is the final expulsion of the end products of katabolism from the excretory organs and includes the expulsion of unabscrbed aliment by the bowel.

In the case of certain products of metabolism, it is hardly possible to state positively whether they represent anabolism or katabolism. Here belong especially the substances formed in connection with secretion, as the digestive enzymes, the hydrochloric acid of the gastric juice, the iodothyrin of the thyroid gland and the adrenalin of the suprarenal gland. In all likelihood both factors participate, for certain substances must be assimilated from the food to form these bodies which in turn are set free in the blood. It is also true that some of these substances act by their mere presence, without apparent waste (catalytic action).

Metabolism of Protein. A relatively small proportion of protein is normally disposed of by oxidation for energy-formation, when carbohydrates and fats enter fully into the diet. But in their absence, protein, by virtue of the fact that it contains the elements of carbohydrates and fats (carbon, hydrogen and oxygen) in its molecule, can furnish all the heat and force required. Certain savages subsist wholly on meat and remain in good health, and in the so-called Salisbury treatment of obesity, etc., it can be demonstrated at will that a patient may subsist for weeks on raw beef without apparent detriment, provided plenty of water is drunk, the excess of water aiding in the elimination of unutilized nitrogen.

When absorbed protein reaches the liver, a large part of the nitrogen is split off and excreted as urea. The remaining portion goes to make good the small daily waste of body protein. The portion of the protein molecule left after the nitrogen is split off is available as fuel. When carbohydrates and fats are liberally supplied, so that protein is not required for fuel, the daily amount needed is comparatively small. Even when the body is losing nitrogen rapidly, as in certain fevers, it has been found that this is partly because the body

protein is being used as fuel, and the loss can be largely prevented by furnishing more energy in the form of carbohydrate or fat. Much confusion has arisen because the excess of nitrogen in the diet is to some extent identical in form with the waste products of cellular activity. Besides urea, some of the chief nitrogenous products of protein metabolism are ammonium salts, uric acid, creatin and creatinin.

The non-nitrogenous portion of protein may be burned or possibly stored, but the nitrogen excess must be eliminated. Because of the fact that excess of nitrogen throws work on the kidneys, it is assumed that an excessive protein diet is injurious to the integrity of these organs. This is evident in diseased kidneys, but cannot be proved for healthy organs. However, it seems unnecessary to consume a great excess of protein and perhaps unwise, owing to the great frequency of fatal kidney diseases. At any rate, except where protein is specially advantageous for ease of digestion, it is unnecessary to make it a large part of the diet.

Metabolism of Fat. Fat, which is passed into the blood from the thoracic duct, is carried over the body and deposited in many organs and tissues, unless needed for immediate use as a source of energy, in which case it is oxidized to carbon dioxide and water. It has been shown that diet-fat may be deposited in the body in the same form as eaten, but the readiest means of forming body fat is usually to give an excess of carbohydrate. The ease with which carbohydrates form fat is shown in the case of cows which produce large quantities of butter fat on an herbivorous diet. It is also possible to form fat from protein, but it is difficult, as a considerable part of the energy of the protein molecule goes to get rid of the nitrogen, and protein increases the rate of metabolism. We know very little of the details of fat metabolism. Some investigators hold that it must be converted into dextrose before it can be oxidized. As already stated, an excess of carbohydrate may be stored in the form of fat.

Metabolism of Carbohydrates. The blood maintains a constant sugar content of about 0.8 per cent. As fast as this

sugar is oxidized, it is replaced by more from the store of glycogen in the liver and muscles, or from newly-formed sugar of recently digested food. The final products of carbohydrate oxidation are carbon dioxide and water, but several intermediate products (as lactic acid) are first formed, probably by the action of enzymes.

When the body is unable to store any more carbohydrate as glycogen, all further storage of excess is in the form of fat.

When sugar is lacking in the blood, as in starvation or failure to utilize carbohydrates, the sugar content is maintained at the expense of protein. This explains why the diabetic who is eating no carbohydrate, may still excrete sugar in the urine. There is some experimental evidence that sugar may be formed also from fat. At any rate, fat is oxidized in absence of carbohydrate, and whether it is first changed to sugar, or oxidized directly, it is a compact means of storing energy, since one gram of fat will yield 2¼ times as much as an equal amount of protein or carbohydrate.

EXCRETION

The waste products of metabolism and all unutilized food, along with the products of oxidation, are eliminated from the system in several ways. Water escapes through the lungs, skin and kidneys. Aside from the obvious fluid perspiration, a steady evaporation takes place from the skin (insensible perspiration). The carbon dioxide produced by oxidation escapes by the lungs, and nitrogenous products of protein metabolism by the urine. The feces in health are made up of the secretions and excretions of the alimentary tract, bacteria, indigestible food waste, and a little undigested food material. When there is excessive putrefaction of the fecal matter, some of the soluble material is absorbed and eliminated in the urine. Generally speaking, putrefaction (of nitrogenous food) and fermentation (of carbohydrates) hold each other in check. Starving people pass feces, thus showing that the bowel is a true excretory organ.

CHAPTER III

FOOD VALUES

NITROGEN BALANCE — ENERGY VALUE OF FOOD

We are now in position to understand something of food values, which depend on the food actually utilized in the body, to the exclusion of food unabsorbed, or eliminated because in excess of the demands of the system. Energy-yielding material which is not used at the time may be stored, but beyond a certain point, stored nutriment must be regarded as undesirable, as in obese subjects.

As stated by Atwater, the food supplies body wants in five ways: (1) tissue-building, (2) tissue-repairing, (3) storage for future use, (4) oxidation to maintain animal heat and (5) oxidation to supply energy; or we may say that according to function, foods are classified as tissue-formers, or body-builders; energy (or work and heat) producers; and regulators of body processes. (See page 5.)

NITROGEN BALANCE OR NITROGEN EQUILIBRIUM

In body building and repairing, the nitrogen of protein food is indispensable. In the other functions, nitrogen is not utilized. Carbohydrates and fats are the natural and convenient sources of energy, although the protein contains in itself non-nitrogenous material capable of oxidation. As already stated, however, to depend largely upon protein for oxidizable food means the ingestion of an enormous quantity of unnecessary nitrogen, the getting rid of which involves waste of energy and is thought to necessitate a strain upon the excretory system. Furthermore, when the diet consists chiefly of protein, much of the latter may not be digested and absorbed as such, but may remain in the intestine, there to

undergo putrefactive changes. In the course of putrefaction certain soluble poisonous substances form and are absorbed, requiring elimination by the kidneys. The excess of nitrogen which cannot be utilized in tissue repair must also be eliminated by the kidneys. Thus while people may thrive on a diet rich in protein, there is considerable evidence that vitality, endurance and resistance to disease are better attained with a diet in which the fuel foods (carbohydrates and fats) predominate.

Nitrogen cannot be stored to any extent and is constantly eliminated in the urine as urea and other nitrogenous substances. When the diet-nitrogen corresponds in amount with the eliminated nitrogen, the metabolism of nitrogen is balanced, or in a state of equilibrium. If too small a quantity of nitrogenous food is taken it does not compensate for the waste of body nitrogen which is inseparable from life. The same thing occurs when for any reason the food nitrogen is not absorbed, or is eliminated without being utilized. This condition of nitrogen starvation is characteristic of underfeeding, wasting diseases, defective assimilation, etc. Conversely equilibrium between food nitrogen and excreted nitrogen represents good nutrition, health and energy; for while nitrogen cannot be permanently stored, it is possible for a balance to be maintained over long periods. It was once taught that increased elimination of nitrogen was due chiefly to the waste of tissue incidental to prolonged and severe muscular or nervous effort; at a later period, however, it became apparent that this waste was comparatively little, and constant for the individual regardless of the amount of muscular exercise, so that the urea nitrogen depends chiefly on the amount of diet nitrogen. The loss of nitrogen in wasting disease, starvation, etc., is, however, extensive; so that in convalescence the body is able to store some nitrogen.

Nitrogen retention is greatly facilitated in all cases by a liberal supply of carbohydrates and fats.

Nitrogen metabolism can hardly be studied in the ordinary patient, on account of the number and variety of tests which

must be accurately made, so that our only guide is the results of scientific investigation of the amounts of nitrogen required under given conditions, and the general well-being of the subject. If weight is maintained, along with a healthy state of functions, the ration in question is suitable for the subject tested. If the individual be in the growing period, the ration should be such that the growth rate is normal. If he be a convalescent, the recovery of the original weight should be constantly progressive. Of late years, however, the emphasis on nitrogen values alone has been largly superseded by greater attention to total fuel values as being of greater practical worth. It is known that a relatively small and easily obtained quantity of nitrogen is sufficient to repair waste in the average individual, but the food required for producing energy is very significant in amount. With a liberal supply of carbohydrates and fats, the ordinary daily waste of nitrogen in one adult may be reduced as low as 3 to 4 grams daily (corresponding to 20 to 25 grams of protein).

To insure a full supply of nitrogen, and to maintain nitrogen equilibrium at a higher level than the bare maintenance requirement, considerably more than this amount is commonly taken. From 80 to 100 grams of protein per day is regarded as a liberal supply for an average man (weighing 70 kilograms or 154 lbs.) on an ordinary mixed diet of suitable energy value.

THE ENERGY VALUE OF FOOD

In Liebig's time it was recognized that animal heat was generated by carbohydrates and fats, but the physiologists of that day did not realize that these were the nutrients which furnished the body with energy for its activity. They thought that all muscular work was done at the expense of nitrogenous material. It has taken many years for us to realize fully that animal energy in all its forms is derived primarily from carbohydrate material, secondly from fats, and thirdly from proteins only in so far as they yield combustible, non-nitrogenous bodies.

Energy may be defined as the power to do work. This force manifests itself in different ways. It may be latent, or inactive; or it may be active in various forms, such as heat; chemical or electrical energy; or mechanical movement, which we call work. It may be changed from one of these forms into another without loss. The most convenient way to measure energy is by transforming it into heat. A unit has been devised to express different amounts of heat, corresponding to a definite number of work units; this is called the calorie. One calorie represents the amount of heat required to raise the temperature of one kilogram of water one degree Centigrade. This is called the large calorie, which is commonly used in determining the energy value of food. The small calorie is $\frac{1}{1000}$ of a large calorie.

Energy cannot be created. We must put into any machine as much force as we expect to get from it. Even in the most efficient machine we cannot recover all of the energy in the form of useful work; some of it is always transformed into heat, owing to friction. This is true even in the body, which is a most efficient machine, but here much of the waste energy in the form of heat is turned to good account in maintaining the body temperature.

The source of energy for the body is food, just as much as the source of energy for the engine is coal. Plants store up the sun's energy, it is transferred to animals which eat the plants, and eventually man gets it by eating the plant and animal foods. The amount of energy in any given food material is measured by the amount of heat which it will produce. In general, this is the same, whether the food be burned outside or inside the body, the total result in any case depending upon the amount of the food-stuff which is utilized by the body.

An instrument devised for the measurement of heat is called a calorimeter. To determine the fuel value of any food material *outside* of the body, a given amount is placed in a calorimeter, where it is burned in an atmosphere of pure oxygen, in a vessel surrounded by water. The heat generated

raises the temperature of the water, and the change is observed with a very delicate thermometer. From this the total heat evolved is calculated. To determine the fuel value of this material *within* the body, the average amount which is lost in digestion, or which is not completely oxidized before excretion, is deducted from the fuel value outside the body. The result is the *physiological fuel value.* Many years ago, Rubner determined averages for proteins, fats, and carbohydrates from experiments on dogs. In recent times, further experiments made in this country on human subjects by Prof. Atwater and his associates have modified these factors somewhat. The following are therefore accepted as the average energy values of food in the body to-day:

1 gram of Protein .... yields 4 Calories
1 gram of Fat .... yields 9 Calories
1 gram of Carbohydrate ... yields 4 Calories

DETERMINATION OF ENERGY VALUE OF FOOD

To determine the energy value of a given amount of any food, it is necessary to know *first* its composition, i. e., the percentages of protein, fat, and carbohydrate present. Tables are available giving the results of many analyses, as in Bulletin 28, Office of Experiment Station, United States Dept. of Agriculture, Washington, D. C., "The Chemical Composition of American Food Materials."

Second. From these percentages to determine the weight of protein fat and carbohydrate *in grams,* which can be obtained from a given amount of the food material.

Third. To multiply these weights by the energy value of one gram of each of the three food principles.

By way of illustration let us find the fuel value of one loaf of bread, weighing 12 ounces.

(1) By referring to Bulletin 28, we find that white bread (miscellaneous) yields on the average,

9.3 % protein.
1.2 % fat.
52.7 % carbohydrate.

(2) To get the weight of protein, fat and carbohydrate in grams, we must first convert the total weight of bread into grams,

	1 oz. =	28.35 grams.
	12 oz. =	340.2 grams.
Then	340.2 × 0.093 =	31.64 grams of protein.
	340.2 × 0.012 =	4.08 grams of fat.
	340.2 × 0.527 =	179.28 grams of carbohydrate.

(3) Multiplying the amount of each nutrient by the proper factor,

31.64 grams protein	× 4 = 126.56	Calories
4.08 grams fat	× 9 = 36.72	Calories
179.28 grams carbohydrate	× 4 = 717.12	Calories
Total	880.40	Calories

Hence the total energy value of 1 loaf of bread weighing 12 ounces is 880.4 calories.

To calculate the total energy value of any *combination of foods,* it is necessary to compute the fuel value of each ingredient, and take the sum of the whole group.

Thus for Egg Broth, page 118, it is necessary first to get the weight in grams of each of the following ingredients and then to estimate their energy value as indicated above.

Yolk of 1 egg	= 13 grams.
1 tablespoon sugar	= 15 grams.
1 cup milk	= 244 grams.
1 tablespoon brandy	= 14 grams.

In this book the food values of all the materials used have been incorporated into a table, so that by reference to this the value of any combination is quickly made.

Yolk of 1 egg	= 48 Calories.
1 tablespoon sugar	= 60 Calories.
1 cup milk	= 169 Calories.
1 tablespoon brandy[1]	= 42 Calories.
Total energy value	319 Calories.

[1] The energy value of alcohol is 7 calories per gram. It is necessary, therefore, to know the per cent. of alcohol in any liquor.

To estimate the fuel value of any *diet,* it is simply necessary to compute the food value of each food material used and add the results together.

To estimate the fuel value of an infant's diet, the following formula, adapted to the above factors for energy value from Friedenwald and Ruhräh's Diet in Health and Disease, is very convenient.

Formula for calculating the *Calories of Any Period of Infant Feeding:*

(1) Quantity $\times$ F $\times$ 2.65 = Calories from fat.
(2) Quantity $\times$ (S + P) $\times$ 1.18 = Calories from protein and sugar.

The sum of 1 and 2 gives the total calories.

Quantity = 24-hour amount in ounces. F, S and P = fat, sugar, and protein respectively, with percents in whole numbers.

To illustrate, take a formula of the following composition:

Protein	0.7%
Fat	2.7%
Carbohydrates	6.0%

Feedings per day 9, amount at each finding 1½ oz.

Hence Q = 13.5 oz. (9 $\times$ 1½)
F = 2.7 oz.
S = 6 oz.
P = 0.7 oz.

(1) Q. $\times$ F $\times$ 2.65 = 13.5 $\times$ 2.7 $\times$ 2.65 = 96.6 Cal.
(2) Q. $\times$ (S + P) $\times$ 1.18 = 13.5 $\times$ (6 + 0.7) $\times$ 1.18 = 106.7 Cal.
96.6 + 106.7 = 203.3 Cal., total for day.

THE ENERGY REQUIREMENTS OF THE BODY

Work goes on continually in the living body, whether asleep or awake, idle or active, sick or well. In the resting body it consists of such internal work as that of digestion and absorption, circulation, respiration, muscular tension, and intracellular work.

In youth these functions are more active than in adult life; in old age they are somewhat less active.

For a man of average weight (154 lbs. or 70 kg.) from 1600 to 2000 cal. daily are required to supply energy for these internal activities. Children require somewhat more in proportion to their body weight, aged persons somewhat less. Beyond this, the factor of most significance in determining the total food requirement for any individual is the *amount of muscular activity.* A man requiring 100 cal. per hour at rest may by hard work raise his energy requirement as high as 500 or 600 cal. per hour. For this reason a person engaged in a sedentary occupation needs less food than one whose work is physical, as a farmer or lumberman. Children are usually more active than adults, and hence in proportion to their weight require more food, while inactive aged persons require very little.

Averages obtained from many observations on the amount of food consumed by individuals under different conditions, show that the energy requirement of the active man of 70 kgs. body weight is approximately 3000 calories.

In making estimates for any individual, age, weight, size and shape, season and climate, mechanical efficiency, etc., must be considered as well as muscular activity.

During the early months of life, children require about 100 cal. per kilogram of body weight. Throughout the years of childhood, they need about 80 calories per kilogram. The adult moderately active, 35–40 cal. per kilogram, and the very aged, about 27 cal. per kilogram.

" The following table, computed by Rubner, shows the daily heat consumption, in units of heat (calories) in an adult, weighing 65 kilograms or 140 lbs."

During rest in bed..	1800 calories or 28 Cal. per kilogram.
In repose	2100 calories or 32 Cal. per kilogram.
In light work.....	2300 calories or 33 Cal. per kilogram.
In moderate work..	2600 calories or 40 Cal. per kilogram.
In hard work.....	3100 calories or 48 Cal. per kilogram.

The total energy requirement for individuals under different conditions of age, weight, and activity are approximately as indicated in the following table:

CONDITIONS	ENERGY PER DAY IN CALORIES
Man at light work	2500–2800 Cal.
Man at moderate work	3000–3500 Cal.
Man at very hard work	4000–5000 Cal.
Woman at light work	1800–2400 Cal.
Woman at moderate work	2400–2800 Cal.
Child from two to six	1200–1800 Cal.
Child from six to fifteen	1800–2500 Cal.
Aged Man	1800–2000 Cal.
Aged Woman	1600–1800 Cal.

The most convenient means of calculating the energy value is afforded by the following table, determined for the adult man of average weight.

AVERAGE NORMAL OUTPUT OF HEAT FROM THE BODY

CONDITIONS OF MUSCULAR ACTIVITY	AVERAGE CALORIES PER HOUR
Man at rest, sleeping	65 Calories
Man at rest, awake, sitting up	100 Calories
Man at light muscular exercise	170 Calories
Man at moderately active muscular exercise	290 Calories
Man at severe muscular exercise	450 Calories
Man at very severe muscular exercise	600 Calories

To illustrate the use of this table, let us calculate the energy requirement of a woman weighing 120 lbs., under the following conditions:

Sleeps 9 hours	$9 \times 65 =$	585 Cal.
Works at desk 8 hours	$8 \times 100 =$	800 Cal.
Walks or does light exercise 3 hrs.	$3 \times 170 =$	510 Cal.
Reads or sits quietly sewing 4 hrs.	$4 \times 100 =$	400 Cal.
		2295 Cal.

Since these factors are for a man weighing 154 lbs., for a woman of 120 lbs. under above conditions, reduce this proportionately to her weight,

154 : 120 : : 2295 : X

X = 1788 cal.— total energy requirement for a woman of 120 lbs., under the above conditions.

The protein requirement is conveniently estimated by providing 10–12 per cent. of the day's energy in the form of protein. Thus for a man whose energy requirement is 3000 cal. per day, 360 cal. from protein (12 per cent.) would correspond to 90 grams of protein, which would be a fairly liberal allowance.

A tall thin person requires more food than a short fat person of equal weight. Also, the person of nervous temperament, in whom muscular tension is high, may require more food than one of phlegmatic temperament. More energy is lost in the form of heat in cold weather than in warm. Because of the numerous factors involved in any case, it is possible to calculate the absolute energy requirement only by rigid scientific experiment. The tables given above, however, are a useful guide to the approximate amount of food required by different individuals.

As an aid to easy estimation of the food value of any diet, the following tables have been introduced, showing the nutritive value of the food materials used in the recipes in this book, calculated for the quantities commonly required in cooking for individuals.

The values for larger amounts will be easily obtained by simple multiplication.

TABLE SHOWING THE NUTRITIVE VALUE OF THE FOOD MATERIALS USED IN THE RECIPES IN THIS BOOK, CALCULATED FOR THE QUANTITIES COMMONLY REQUIRED IN COOKING SMALL PORTIONS[1]

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
A		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Almonds, Shelled..........	1 cup	4 2/5	133	27.9	72.9	23.0	859
Apples, Fresh..............	1 medium	5	150	0.5	0.5	16.0	70
"	1 cup	3	85	1.4	1.8	56.2	247
Apricots, Dried............	1 cup	5	142	6.6	1.4	88.5	391
Arrowroot..................	1 tbsp.	1/3	10	....	....	9.8	39
Asparagus..................	1 bunch	44 (2 3/4 lbs.)	1247	22.4	2.4	41.0	276
B							
Bacon (cooked)............	1 serving	3/10	10	2.0	6.0	....	62
" (raw)...............	1 lb.	16	454	43.0	269.4	....	2597
Bananas..................	1 medium	3 1/2	100	0.8	0.4	14.0	64
Barley, Pearl..............	1 tbsp.	1/2	15	1.3	0.2	11.7	54
" Crushed...........	1 tbsp.	1/2	14	1.1	0.1	11.3	51
" Flour..............	1 tbsp.	1/2	16	1.3	0.2	12.5	57
" "	1 cup	8	227	19.0	2.5	174.3	796
Bass (edible portion).......	1 serving.	3 1/2	100	18.6	2.8	....	100
" " "	1 lb.	16	454	84.3	12.6	....	452
Bean Flour................	1 tbsp.	3/10	8	1.8	0.1	4.8	28
" "	1 cup	4 2/5	125	29.3	2.3	77.5	448
Beans, String..............	1 serving	4	113	2.4	0.3	5.8	44
Beef Broth................	1 serving	3 1/2	100	1.8	1.0	....	16
" "	1 quart	32	907	16.5	9.3	....	149
Beef Juice.................	1 serving	3 1/2	100	4.9	0.6	....	25
Beef Marrow..............	1 tbsp.	1/2	14	0.3	13.1	....	120
" "	1 lb.	16	454	9.9	420.8	....	3828
Beef Steak, Porterhouse....	1 serving	3 1/2	100	19.1	18.0	....	238
" " "	1 lb.	16	454	86.6	81.2	...	1077
" " Rump.........	1 serving	3 1/2	100	21.0	13.7	....	207
" " "	1 lb.	16	454	94.8	62.1	....	938
" " Sirloin.........	1 serving	3 1/2	100	16.5	16.1	....	211
" " "	1 lb.	16	454	74.8	73.0	....	957
" " Top of Round...	1 serving	3 1/2	100	19.5	7.3	....	144
" " " " " ...	1 lb.	16	454	88.4	33.1	....	652

[1] Food values according to individual servings, note page 71A.

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
		Ozs.	Gms.	Gms.	Gms.	Gms.	Calories
B—(Continued)							
Blue Fish (edible portion)...	1 serving	$3\frac{1}{2}$	100	19.4	1.2	....	88
" " " " ...	1 lb.	16	454	87.8	5.4	....	401
Brandy..................	1 tbsp.	$\frac{1}{2}$	14	....	....	....	42
Bran.....................	1 cup	$2\frac{1}{2}$	71	7.8	1.5	43.4	218
Brazil Nuts, Shelled........	1 lb.	16	454	76.9	302.8	31.6	3048
" " "	1 nut	$\frac{1}{4}$	....	1.2	4.7	0.01	47
" " "	1 tbsp. chopped	$\frac{3}{4}$	....	3.6	14.2	0.1	142
Bread, White..............	1 slice	1	28.4	2.6	0.3	15.0	73
" "	1 loaf	12	340	31.6	4.1	179.3	881
" Crumbs (dry).......	1 cup	$4\frac{4}{5}$	136	12.6	1.6	71.7	352
" Boston Brown.......	1 small slice	1	28.4	1.5	0.5	13.3	64
" Gum Gluten........	1 slice	1	28.4	8.4	.3	8.5	70
" " "	1 loaf	13	386.5	114.0	4.0	116.3	957
Butter....................	1 tbsp.	$\frac{1}{2}$	14	0.1	12.1	....	109
"	1 cup	8	227	2.2	193.0	....	1744
C							
Carrots...................	1 small	2	57	0.5	....	4.2	20
Cauliflower...............	1 serving	4	113	2.0	0.6	5.2	35
Celery....................	1 serving	2	57	0.6	....	1.9	11
Cheese, American..........	1 tbsp.	$\frac{1}{2}$	15	4.0	5.0	....	62
" " (fresh grated)	2 tbsp.	1	28	8.0	10.0	....	124
" Cottage...........	1 serving	1	28	5.9	0.2	1.2	31
" Cream............	2 tbsp. ($1\frac{1}{2}$ cubic inch)	$\frac{4}{5}$	24	6.1	8.1	0.6	100
Chicken (edible portion)....	1 serving	$3\frac{1}{2}$	100	21.4	2.5	....	108
"	1 lb.	16	454	97.5	11.3	....	492
Chocolate (unsweetened)....	1 square	1	28.4	3.6	13.8	8.5	173
" "	1 lb.	16	454	58.5	220.9	137.4	2772
Clams (edible portion)......	1 serving	$3\frac{1}{2}$	100	8.6	1.0	2.0	51
Clam Bouillon.............	1 serving	$3\frac{1}{2}$	100	0.2	....	0.2	2
" "	1 quart	32	906	2.0	0.8	1.6	23
Claret (10% alcohol).......	1 tbsp.	$\frac{1}{2}$	14	....	....	....	10
Cocoa.....................	1 tbsp.	$\frac{1}{4}$	7	1.5	2.0	2.5	35
Cod, Fresh (edible portion)..	1 serving	$3\frac{1}{2}$	100	16.5	0.4	....	70
" "	1 lb.	16	454	74.8	1.8	....	315
Cod Fish, Salt, Boneless....	1 serving	2	57	15.7	0.2	....	64
" " " "	1 lb.	16	454	125.6	1.4	....	515

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
C—(Continued)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Condensed Milk	1 teaspoon	3/10	11	0.9	1.0	6.0	37
" "	....	1	28	2.3	2.7	15.6	96
" "	1 can	16	450	36.3	43.7	250.6	1541
Consomme	1 serving	3 1/2	100	2.5	....	0.4	12
"	1 quart	32	906	23.0	....	3.5	106
Corn	1 cup	9	253	7.8	3.0	48.1	248
Cornmeal	1 tbsp.	1/3	10	0.8	0.2	7.1	33
"	1 cup	5	142	13.0	2.6	106.8	504
Cornstarch	1 tbsp.	1/3	10	....	....	9.5	38
"	1 cup	5 1/2	156	....	....	148.2	592
Cracker Crumbs	1 cup	5	151	16.5	9.0	110.2	588
Crackers, Water	1 large	1/3	10	1.2	0.5	7.6	40
Cream, Thin (18%)	1 tbsp.	1/2	14	0.4	2.8	0.7	29
" " "	1 cup	8	227	5.6	41.9	10.2	440
" Thick (40%)	1 tbsp.	1/2	14	0.3	6.0	0.5	57
" " "	1 cup	8	227	5.0	90.7	6.8	864
Cucumbers, Fresh (ed. por.)	....	1	28	0.2	.06	0.8	5
Currants, Fresh	1 cup	5	142	2.1	....	18	81
" Dried	1 cup	8	227	5.4	3.8	84	728
D							
Dates	1 cup (with stones)	7	200	3.8	5.0	140.0	623
Dry Peptonoids, Soluble	1 tbsp.	2	159	6.0	....	8.0	57
E							
Eggs[1], whole small size (without shell)	1	1 1/2	45	5.4	4.2	....	60
Eggs[1], White	1	9/10	25	3.3	....	....	13
Eggs[1], Yolk	1	1/2	13	2.1	4.5	....	48
F							
Farina	1 tbsp.	1/3	10	1.0	0.1	7.2	34
"	1 cup	6	170	18.7	2.3	129.8	616
Figs	1 fig (lge)	1	28	1.3	0.1	22.2	95
"	1/2 lb.	8	227	9.7	0.7	168.2	718
Filberts, Shelled	1 lb.	16	454	70.7	296.2	58.9	3184
" "	1 doz.	3/4	21	3.3	13.8	2.7	150
" "	1 tbsp. (chopped)	1/5	6	0.9	3.9	0.8	42

[1] Note Eggs, page 71C.

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
		Ozs.	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
F—(Continued)							
Flour, Barley	1 tbsp.	1/3	8	0.7	0.1	6.3	29
" "	1 cup	8	227	19.0	2.5	174.3	796
" Gum Gluten	1 tbsp.	1/3	8	3.4	.1	3.4	29
" " "	1 cup	5	142	60.0	2.3	63.0	512
" Graham	1 tbsp.	1/3	8	1.2	0.2	5.7	30
" "	1 cup	5	142	20.2	3.2	101.2	509
" Rice	1 tbsp.	1/4	7	0.6	0.5	5.1	27
" "	1 cup	4 1/2	128	10.9	7.8	86.8	461
" Rye	1 tbsp.	1/3	8	0.5	...	6.3	28
" "	1 cup	5	142	9 6	1.3	111.5	496
" Wheat (roller process)	1 tbsp.	1/3	8	0.9	...	6.0	28
" " " "	1 cup	4 1/2	126	15.2	3.2	84.8	445
Fowl (edible portion)	1 serving	3 1/2	100	19.3	16.3	....	224
" " "	1 lb.	16	454	87.5	73.9	....	1015
G							
Gelatin, Granulated	1 tbsp.	3/10	8	7.8	....	....	31
" "	1 box	1 1/5	34	31.1	....	....	125
" Shredded	1/2 box	3/5	17	15.6	....	....	62
Gum Gluten Flour	1 tbsp.	1/3	8	3.4	.1	3.4	29
" " "	1 cup	5	142	60.0	2.3	63.0	512
" " "	1 lb.	16	454	191.0	7.3	200.0	1629
" " Bread	1 slice	1	28	8.4	.3	8.5	70
" " "	1 loaf	13	386	114 0	4.0	116.3	957
" " Biscuit Crisp	1 biscuit	1/4	7	0.7	0.1	5.6	25
" " Noodles	1 cup	3 1/2	100	45.0	4.2	32.5	350
Greens	1 serving	4	113	2.3	0.3	3.6	27
Grapes, Malaga	1 dozen	2	57	0.7	0.9	10.8	55
" " (A. P.)	1 lb.	16	454	4.5	5.4	65.3	328
Grape Juice	1 tbsp.	1/2	14	....	....	3.8	15
" "	1 cup	8	227	....	....	60,0	240
H							
Haddock (edible portion)	1 serving	3 1/2	100	17.2	0.3	....	72
" " "	1 lb.	16	454	77.9	1.3	....	324
Halibut (edible portion)	1 serving	3 1/2	100	18.6	5.2	....	121
" " "	1 lb.	16	454	84.3	23.5	....	549
Ham, Fresh, Lean	1 serving	3 1/2	100	24.8	14.2	....	227
" " "	1 lb.	16	454	112.6	64.4	....	1029
Hickory Nuts, Shelled	1 lb.	16	454	69.7	305.6	51.6	3234
" " "	1/4 cup (chopped)	1 1/2	....	6.5	28.5	4.8	303
" " "	1 tbsp. (chopped)	1/2	....	2.1	9 5	1.6	101

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
H—(Continued)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Hominy	1 tbsp.	1/2	14	1.2	0.1	11.2	50
"	1 cup	5 1/2	157	13.0	1.0	110.0	565
Honey	1 tbsp.	1	28	0.1	....	23.0	92
J							
Jell-O	1 box	3 1/2	100	11.2	....	86.4	395
"	1 serving	3/5	16	1.9	....	14.4	66
K							
Kumyss	1 qt.	34 2/5	975	2.2	2.1	1.5	328
L							
Lamb Chops	1 serving	3 1/2	100	18.7	28.3	....	329
" "	1 lb.	16	454	84.8	128.3	....	1494
Lard	1 tbsp.	1/2	14	....	14.0	....	127
"	1 lb.	16	454	....	484.0	....	4083
Lemon Juice (1 lemon)	3 tbsp.	1 1/2	42	....	....	4.2	17
Lentil Flour	1 tbsp.	3/10	9	2.3	0.9	5.3	31
" "	1 cup	5	144	37.0	1.4	85.0	500
Lettuce	1 head	8	227	2.3	0.5	5.7	36
Liquid Peptonoids	1 tbsp.	1/2	15	0.8	....	2.1	28
Lobster (edible portion)	1 serving	3 1/2	100	18.1	1.1	0.5	84
" " "	1 lb.	16	454	82.0	4.9	2.2	382
M							
Macaroni	1 cup	3 4/5	108	14.7	1.0	81.1	392
Mackerel, Fresh (ed. por.)	1 serving	3 1/2	100	18.7	7.1	....	139
" " "	1 lb.	16	454	84.8	32.1	....	629
" Salted	1 serving	3 1/2	100	17.3	26.4	....	307
" "	1 lb.	16	454	78.5	119.7	....	1392
Malted Milk, Horlick's	1 tbsp.	1/2	14	2.3	1.2	9.5	59
Milk, Whole	1 tbsp.	7/10	20	0.6	0.8	1.0	14
" "	1 cup	8 3/5	244	8.0	9.3	12.2	169
" "	1 quart	34 2/5	975	32.2	39.0	48.8	675
" Skimmed	1 tbsp.	7/10	20	.7	...	1.0	7
" "	1 cup	8 3/5	244	8.3	0.7	12.5	89
" "	1 quart	34 2/5	975	33.1	2.9	49.7	358
Molasses	1 tbsp.	4/5	27	0.6	....	18.7	77
"	1 cup	11	317	7.6	....	219.7	909
Mutton Chops	1 serving	3 1/2	100	16.0	33.1	....	362
" "	1 lb.	16	454	72.5	150.1	....	1640

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
N		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Noodles, Gluten	1 cup	3½	100	45.0	4.2	32.5	434
O							
Oatmeal, Granulated	1 tbsp.	½	14	1.8	0.9	9.9	55
" "	1 cup	5½	156	25.1	11.2	105.2	623
Oats, Rolled	1 tbsp.	1/5	5	0.7	0.3	2.7	16
" "	1 cup	2½	71	11.8	5.2	46.9	282
Olive Oil, Nicelle	1 tbsp.	½	15	....	15.0	....	135
Olives	2 or 3	½	14	0.1	2.8	1.2	31
Onion	1 serving	4	113	1.8	0.3	11.2	56
Orange, E. P	1 medium	5	142	1.2	0.3	16.4	73
Orange Juice	1 tbsp.	½	14	....	....	1.6	6
" "	1 cup	8	227	....	....	25.6	104
Oysters	2	1	28.4	1.7	0.3	1.0	14
"	1 cup (solid)	8½	240	14.4	3.1	7.9	118
P							
Panopepton	1 tbsp.	½	15	1.0	....	2.5	30
Peaches, Fresh	1 medium	4	113	0.8	0.1	11.3	50
" Dried	1 cup	3	85	1.4	1.8	56.2	247
Peach Juice	1 tbsp.	½	14	....	....	1.1	5
" "	1 cup	8	227	....	....	17.6	80
Peanuts, Shelled	1 cup	5	142	36.5	54.7	34.5	777
Peanut Butter	1 tbsp.	3/5	16	4.8	7.7	2.8	100
Peas, Green	1 serving	4	113	7.7	0.5	19.6	114
" Canned	1 cup	6½	184	6.6	0.4	18.0	100
Pea Flour	1 tbsp.	3/10	9	2.3	1.0	5.8	41
" "	1 cup	5	144	36.9	16.0	93.0	656
Pecans, Shelled	1 cup	5½	156	15.0	110.0	23.8	1145
Pineapple, Fresh (ed. por.)	....	8	227	0.9	0.7	22.0	98
" Canned	1 slice	1 4/5	53	0.2	0.3	19.3	81
" "	1 cup	10 1/5	290	1.2	2.0	10.6	444
" "	1 can	24	680	2.6	4.8	247.0	1044
Port Wine (10% alcohol)	1 tbsp.	½	14	....	....	....	10
Potatoes, White	1 medium	3½	100	2.2	0.1	18.4	83
" Sweet	1 medium	3½	100	1.8	0.7	27.4	123
Prunes	1 cup	5	142	2.5	....	88.1	363
"	3 prunes	1	28	0.5	....	17.6	72

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
		Ozs.	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Q							
Quail	1 serving	3½	100	21.8	8.0	....	159
R							
Raisins	1 dozen	⅓	9	0.2	0.3	6.8	31
"	1 cup	5	142	3.3	4.3	97.1	440
Raspberries, Fresh, Black (edible portion)	1 cup	5	142	2.4	1.4	17.8	94
Raspberry Juice	1 cup	8	227	....	....	22.6	90
Rhubarb	....	1	28	0.2	0.2	1.0	6
"	....	16	454	2.7	3.2	16.3	105
Rice	1 tbsp.	½	15	1.1	...	11.2	50
"	1 cup	7	200	16.0	0.6	158.0	702
Rum	1 tbsp.	½	14	....	....	....	38
S							
Salmon (edible portion)	1 serving	3½	100	22.0	12.8	....	203
" " "	1 lb.	16	454	99.6	57.9	....	922
Saltines	1 wafer	⅛	3	0.4	0.5	2.4	15
Sardines, Canned	1 serving	3½	100	23.0	19.7	....	269
" "	1 can	16	454	104.3	89.2	....	1221
Shad (edible portion)	1 serving	3½	100	18.8	9.5	....	161
" " "	1 lb.	16	454	85.1	43.0	....	729
" Roe	1 serving	3½	100	20.9	3.8	2.0	128
Sherry	1 tbsp.	½	14	....	....	....	13
Spinach (cooked)	1 serving	3	87	1.1	0.2	2.6	16
Squabs	1 serving	3½	100	16.3	36.2	....	391
Squash (cooked)	1 serving	3½	100	1.4	0.5	9.0	46
Strawberries (edible portion)	1 serving	4	113	1.0	0.7	7.9	42
" " "	1 cup	6	170	1.5	1.0	11.9	63
Strawberry Juice	1 cup	8	227	....	....	11.4	45
Suet	1 tbsp.	½	14	....	11.6	....	107
"	1 lb.	16	454	21.3	371.0	....	3425
Sugar, Granulated	1 tbsp.	½	15	....	....	15.0	60
" "	1 cup	7½	210	....	....	210.0	840
" Loaf	1 lump	⅖	7	....	....	7.0	28
" "	1 cup	6.5	184	....	....	184.0	736
" Powdered	1 tbsp.	½	12	....	....	12.0	48
" "	1 cup	6.5	184	....	....	184.0	736

FOOD MATERIAL (Uncooked)	Measure	Weight		Protein	Fat	Carbo-hydrates	Fuel Value
S—(Continued)		*Ozs.*	*Gms.*	*Gms.*	*Gms.*	*Gms.*	*Calories*
Sugar of Milk	....	....	1	....	....	....	4
" " "	1 teaspoon (aver. size)	1/9	3	....	....	3.5	14
" " "	1 tbsp.	1/3	10	....	....	10.0	40
Sweetbreads	1 serving	3½	100	16.8	12.1	....	176
"	1 lb.	16	454	76.2	54.8	....	798
"	1 pair (med. size)	8	227	38.1	27.4	....	399
T							
Tomatoes	1 tbsp.	½	15	0.2	....	0.6	4
"	1 cup	8	227	2.7	0.5	9.0	51
"	1 medium (whole tomato)	5	142	0.5	0.3	3.0	16
Tapioca, Pearled	1 tbsp.	½	14	....	....	12.3	49
" "	1 cup	6½	180	0.7	....	158.4	640
" Minute Tapioca	1 tbsp.	½	14	....	....	12.2	49
Trout (edible portion)	1 serving	3½	100	17.8	10.3	....	164
" " "	1 lb.	16	454	80.6	46.7	....	743
Turnip	1 serving	3½	100	1.3	0.2	8.1	39
Turkey (edible portion)	1 serving	3½	100	21.1	22.9	....	290
" " "	1 lb.	16	454	95.7	103.9	....	1317
W							
Walnuts, English	1 cup	5½	156	25.8	98.8	25.1	1093
" "	1 meat	....	1	.1	0.6	0.1	7
Whey	1 glass	6½	184	1 8	0.5	9.3	50
Whitefish (edible portion)	1 serving	3½	100	22.9	6 5	....	150
" " "	1 lb.	16	454	103.8	29.4	....	681

The weights assigned to the various measurements in this table have been determined carefully, but are the results of a limited number of experiments, and hence must be regarded as only approximate. The food values are given with sufficient accuracy to be within the limits of error of computations made on average analysis of food-stuffs.

FOOD VALUES ACCORDING TO INDIVIDUAL SERVINGS[1]

A

		Calories
Almonds (15% car.)	10 gms. (10 small)	63
Artichokes (15% car.)	230 gms. (1 small)	175
Apple (15% car.) raw	150 gms. (1 medium)	70
Apple Sauce (cooked)	1 oz. (abt. 2 tbsp.)	30
Apricots (15% car.) dried, stewed	¼ cup, 2½ oz	100
Arrowroot (uncooked)	14 gms. (1 level tbsp.)	55
Asparagus (5% car.) canned	200 gms. (5 stalks)	36

B

Brussels Sprouts (5% car.)	65 gms. (¾ cup)	10
Bacon (raw)	100 gms. (4 slices, 6 in. long, 2 in. wide)	636
Bacon (cooked)	100 gms. (4 slices, 6 in. long, 2 in. wide, measured before cooking)	318
Bananas (20% car.)	100 gms (1 medium)	64
Barley (pearl)	27 gms. (1 level tbsp.)	90
Barley (crushed)	14 gms. (1 level tbsp.)	51
Barley (flour)	16 gms. (1 level tbsp.)	57
Bass (edible portion)	100 gms. (1 average serving)	100
Beans, String (5% car.), fresh cooked	70 gms. (½ cup, cut in small pieces, 3 heaping tbsp.)	25
Beans (20% car.) dried	100 gms. (½ cup.) raw	350
Bean (flour)	8 gms. (1 level tbsp.)	28
Black Berries (10% car.)	100 gms. (full ¼ cup, 3 oz.)	59
Beets (10% car.) cooked	100 gms. (1 serving, 2 heaping tbsp.)	37

[1] The calory values given in the table are approximate, for the most part, but are sufficiently accurate for practical purposes. The values stated are based upon the tables of Atwater and Bryant, Schall and Heisler, Arnold's Diet Chart, Dr. W. Coleman, Hill and Eckman; and from the preceding table given in this book.

For list of foods arranged approximately to per cent of carbohydrates note page 370.

For list of foods in order of their carbohydrate content from the lowest to highest note page 368.

Five per cent thrice cooked (boiled) vegetables are considered carbohydrate free.

Five per cent vegetables (cooked) "100 grams" are measured "2 heaping tbsp." although in reality the weight varies slightly.

For list of five per cent vegetables note page 370.

Cereals (cooked) "1½ oz. equals 50 calories" are measured "1 heaping tbsp."

B—(Continued)

		Calories
Beet greens (5% car.)	100 gms. (1 average helping, 2 heaping tbsp.)	23
Beef Broth	100 gms. (1 serving)	16
Beef Juice	100 gms. (1 serving)	25
Beef, Roast	1 slice 4½ × 1½ × ⅓ in.	89
Beef Steak (porterhouse)	100 gms. (1 serving)	238
" " (rump)	100 gms. (1 serving)	207
" " (sirloin)	100 gms. (1 serving)	211
" " (top of round)	100 gms. (1 serving)	144
Blue Fish	100 gms. (1 serving)	88
Brandy	14 gms. (1 tbsp.)	42
Bran	71 gms. (1 cup)	218
Brazil Nuts (10% car.) shelled.	1 nut	48
Bread, White	33 gms. (average slice 3 × 3½ × ½)	80
" " (crumbs)	136 gms. (1 cup)	352
" Boston Brown	28.4 gms. (1 small slice)	64
" Gum Gluten	28.4 gms. (1 slice)	70
Butter	⅓ oz. (1 pat)	80
"	½ oz. (1 level tbsp.)	109
"	25 gms. (1¼ in. cube)	195
Buttermilk	10 oz. 1⅛ cups	100

C

Cabbage (5% car.) raw	100 gms. (1½ cups shredded)	30
" (5% car.) cooked	100 gms. (abt. 2 heaping tbsp.).	35
Carrots (10% car.) cooked	100 gms. (abt. 2 heaping tbsp.).	45
Cauliflower (5% car.) cooked	100 gms. (abt. 2 heaping tbsp.).	33
Celery (5% car.) uncooked	100 gms. (abt. 6 pieces 4½ in. long and medium thickness or ¾ cup 1 in. pieces)	17
Cereals (cooked) [1]	1½ oz. (1 heaping tbsp.)	50
Cheese (Neufchâtel)	1 cheese (2¼ × 1½ × 1¼).	284
" (American)	15 gms. (1 tbsp.)	62
" (" fresh grated)	1 gm. (2 tbsp.)	124
" (Cottage)	28 gms. (1 serving, 1½ tbsp.).	27
Cherries (5% car.), uncooked, stoned	100 gms. (⅞ cup)	88

[1] Cereals (cooked) "1½ oz. equals 50 calories" are measured "1 heaping tbsp."

C—(Continued)

		Calories
Chestnuts (40% car.) uncooked	100 gms.	243
Chicken (ed. portion), uncooked.	100 gms. (1 serving)	108
Chocolate (unsweetened)	284 gms. (1 square)	173
Clam Bouillon	100 gms. (1 serving)	2
Claret	14 gms. (1 tbsp.)	10
Cocoa (uncooked)	7 gms. (1 level tbsp.)	35
Cod, Fresh (edible portion), uncooked	100 gms. (1 serving)	70
" Salt (boneless) uncooked	57 gms. (1 serving)	64
Condensed Milk (sweetened)	11 gms. (1 tsp.)	37
Consomme	100 gms. (1 serving)	12
Corn (20% car.), green	100 gms. (1 serving, 1½ cup)	100
Cornmeal (raw)	10 gms. (1 tbsp.)	33
Cornstarch (raw)	10 gms. (1 tbsp.)	38
Crackers	1 oz	114
" (Uneeda Biscuit)	1 cracker	20
" (Water)	10 gms. (1 large)	40
Cream (16%)	7 oz. 1 glass	359
" (18%)	½ oz. (1 tbsp.)	29
" (20%)	1 oz. (2 tbsp.)	60
" (40%)	½ oz. (1 tbsp.)	57
Cucumbers (5% car.) raw	100 gms. (12 slices ⅛ in. thick, ½ in. in diameter)	12
Cranberries (10% car.) raw	100 gms.	48
Currants (15% car.), raw	100 gms.	57

D

Dates	227 gms. (1 cup with stones)	710
Dandelion Greens (5% car.) cooked	100 gms. (1 average helping, 2 heaping tbsp.)	23

E

Egg, small (whole, without shell)	1½ oz. (45 gms.)	60
" small, white	$^9/_{10}$ oz. (25 gms.)	13
" small, yolk	½ oz. (13 gms.)	48
Egg, medium (whole, without shell)	1.7 oz. (49 gms.)	73
" medium, white	1.09 oz. (31 gms.)	18

E—(Continued)

		Calories
Egg, medium, yolk	.06 oz. (18 gms.)	55
Egg, large (whole, without shell)	2 oz. (57 gms.)	80
" large, white	1⅓ oz. (38 gms.)	30
" large, yolk	⅔ oz. (19 gms.)	50
Egg (whole, without shell)	100 gms.	147
Egg plant (5% car.)	100 gms. (3.5 oz.)	30
English Walnuts	20 gms. (6 whole meats)	140

F

Farina (uncooked)	10 gms. (1 level tbsp.)	34
Farina (cooked)	1½ oz. (1 heaping tbsp.)	50
Figs	28.4 gms. (1 fig.)	95
Filberts (10% car.), shelled	½ oz. (1 tbsp. chopped)	100
Fowl (edible portion)	100 gms. (1 serving)	224
Fish (average)	100 gms. (1 average helping)	147
Flour, Barley	16 gms. (1 level tbsp.)	57
" Gum Gluten	8 gms. (1 level tbsp.)	29
" Graham	8 gms. (1 level tbsp.)	34
" Rice	16 gms. (1 level tbsp.)	58
" Rye	8 gms. (1 level tbsp.)	28
" Wheat (roller process)	8 gms. (1 level tbsp.)	28
Flounder, Fresh	100 gms. (3½ oz.)	30

G

Gelatine (granulated)	8.5 gms. (1 level tbsp.)	31
Greens (cooked)	100 gms. (1 average helping, 2 heaping tbsp.)	23
Grape Fruit (5% car.) small as purchased	300 gms. (1 small)	131
Grape (malaga)	57 gms. (1 doz.)	55
Grapes	100 gms.	71
Grape Juice	14 gms. (1 tbsp.)	15
" "	227 gms. (1 cup)	240

H

Haddock (edible portion)	100 gms. (1 serving)	72
Halibut (edible portion)	100 gms. (1 serving)	121
Ham, Fresh (lean)	100 gms. (1 serving)	227
Hickory Nuts (10% car.), shelled	½ oz. (1 tbsp.)	101
Hominy (uncooked)	14 gms. (1 tbsp.)	50

		Calories
H—(Continued)		
Hominy (cooked)	1½ oz. (1 heaping tbsp.)	50
Honey	1 oz. (1 tbsp.)	92
Huckleberries (15% car.)	100 gms	74
J		
Jell-O	100 gms. (1 box)	395
"	16 gms. (1 serving)	66
K		
Kohl-rabi (10% car.), fresh	98 gms. (¾ cup)	25
Kumyss	487 gms. (1 pt.)	164
L		
Lactose (see Milk Sugar)	9 gms. (1 level tbsp.)	36
Lamb	Slice 2 × 1½ × ¾ ins., 2 oz.	100
" Chop	100 gms. (1 serving)	329
Lard	14 gms. (1 level tbsp.)	127
Lager Beer	250 c.c. (1 glass, ½ pt.)	130
Lemon Juice (10% car.), 1 lemon	42 gms. (3 tbsp.)	17
" " (10% car.)	100 gms. (7 tbsp.)	39
Lentil Flour	9 gms. (1 level tbsp.)	31
Lettuce (5% car.)	100 gms. (10 or 12 medium-sized leaves)	19
Lima Beans (15% car.) canned	130 gms. (½ cup)	100
Lobster	100 gms. (1 serving)	84
M		
Macaroni (20% car.), cooked	100 gms. (⅝ cup)	63
Mackerel, Fresh (edible portion)	100 gms. (1 serving)	139
Mackerel, Salted	100 gms. (1 serving)	222
Malted Milk	14 gms. (1 level tbsp.)	59
Mayonnaise	15 gms. (1 tbsp.)	100
Milk, Whole	20 gms. (1 tbsp.)	14
" "	244 gms. (1 cup, ½ pt.)	169
Milk, Skimmed	20 gms. (1 tbsp.)	7
" "	244 gms. (1 cup, ½ pt.)	89
Molasses	27 gms. (1 tbsp.)	77
"	317 gms. (1 cup, ½ pt.)	909
Muskmellons (edible portion)	100 gms	39
Mushrooms (10% car.) raw	100 gms. (11 one in. diameter)	45
Mutton Chops	100 gms. (1 serving)	362

N

		Calories
Noodles, Gluten (uncooked)....	100 gms. (1 cup).............	434

O

Oatmeal (granulated), uncooked	14 gms. (1 tbsp.)............	55
" (cooked).............	1½ oz. (1 heaping tbsp.)....	50
Oats (rolled), uncooked........	5 gms. (1 tbsp.)............	16
" (rolled), cooked..........	1½ oz. (1 heaping tbsp.)....	50
Okra (5% car.), canned.......	115 gms. (⅔ cup)............	20
Olive Oil....................	½ oz. 15 gms. (1 tbsp.)....	135
Olives (5% car.)..............	14 gms. (2 or 3 olives).......	31
Onions (10% car.), raw........	100 gms. (2 onions, size of egg)..	48
" (10% car.), cooked.....	100 gms. (2 onions, size of egg)..	48
Oranges (10% car.)...........	142 gms. (1 medium).........	77
Orange Juice (10% car.).......	14 gms. (1 tbsp.)............	6
" " (10% car.).......	227 gms. (1 cup).............	104
Oysters......................	28.4 gms. (2 oysters)........	14
"	100 gms. (7 oysters)..........	49

P

Parsnips (15% car.), stewed....	100 gms. (4 pieces, 3½ × 1½ × ⅓ ins.)...............	57
Peaches (10% car.), fresh, edible portion................	100 gms. (1 small)............	41
" (10% car.), fresh, edible portion................	113 gms. (1 medium).........	50
" Dried (uncooked)......	85 gms. (1 cup).............	247
Peach Juice (10% car.)........	14 gms. (1 tbsp.)............	5
" "	227 gms. (1 cup).............	80
Peanut Butter................	16 gms. (1 tbsp.)............	100
Peanuts (15% car.) Shelled....	100 gms. (¾ cup)............	554
Peanuts (15% car.), as purchased	15 nuts.....................	33
Peas (15% car.), green, raw....	100 gms. (2 heaping tbsp.).....	99
Peas, Dried..................	100 gms.....................	362
Pea Flour (raw)...............	9 gms. (1 level tbsp.).......	33
Pears (15% car.), edible portion.	100 gms. (2 pear halves + 2 tbsp. of juice)..........	65
Pecans (10% car.), shelled.....	100 gms. (¾ cup)............	858
Pineapple (10% car.), fresh, edible portion............	100 gms. (¾ sliced)..........	45

P—(Continued)

		Calories
Pineapple (canned)	85 gms. (1 slice)	130
Plums (20% car.), edible portion	100 gms. (3 large)	86
Pork, Loin	40 gms	100
Pork, Tenderloin	100 gms	200
Port Wine (10% alcohol)	14 gms. (1 tbsp.)	10
Potatoes (20% car.), white, baked	100 gms. (1 medium, size of large egg)	83
Potatoes (20% car.), white (mashed)	100 gms. (2 rounding tbsp.)	83
" Sweet	100 gms. (½ medium)	123
Prunes	28 gms. (3 prunes)	72
Prunes	100 gms. (¾ cup)	308
Pumpkin (10% car.)	6½ oz. (1 cup)	100

Q

Quail (uncooked)	100 gms. (1 serving)	159

R

Radishes (5% car.)	12 red button, 125 gms.	34
Raisins	9 gms. (1 doz.)	29
Raisins	100 gms. (1 scant cup)	348
Raspberries (15% car.)	100 gms. (⅝ cup)	53
Raspberry Juice	113 gms. (½ cup)	45
Rhubarb (5% car.), raw	28 gms. (¼ c. in 1 in. pieces)	6
Rice (raw)	15 gms. (1 tbsp.)	50
Rice (boiled)	50 gms. (6 tbsp. level)	50
Rum	14 gms. (1 tbsp.)	38

S

Salmon (edible portion), fresh	100 gms. (1 serving)	203
Saltines	3 gms. (1 wafer)	15
Sardines	100 gms. (28 sardines, sml. box)	269
Shad (edible portion)	100 gms. (1 serving)	161
Shad Roe	100 gms. (1 serving)	128
Sherry	14 gms. (1 tbsp)	13
Spinach (5% car.)	100 gms. (2 heaping tbsp.)	23
Squabs	100 gms. (1 serving)	391
Squash (10% car.)	100 gms. (2 heaping tbsp.)	46
Strawberries (10% car.)	100 gms. (small serving)	38

S—(Continued)

		Calories
Strawberry Juice	100 gms. (⅓ cup)	19
Suet	14 gms. (1 level tbsp.)	107
Sugar (granulated)	5 gms. (1 level tbsp.)	60
Sugar (loaf)	7.6 gms. (1 large lump)	30
Sugar (loaf)	3.8 gms. (1 small lump)	16
Sugar (powdered)	12 gms. (1 level tbsp.)	48
Sugar of Milk [1]	1 gm. (⅓ tsp.)	4
Sugar of Milk [1]	9 gms. (1 full level tbsp.)	36
Sweetbreads	100 gms. (1 serving)	176
Sauerkraut (5% car.)	115 gms. (¾ cup, packed)	30
T		
Tomatoes (5% car.) raw	100 gms. (1 small, 2 in. dia.)	20
Tomatoes (5% car.) cooked	100 gms. (2½ heaping tbsp.)	20
Tapioca, pearl (raw)	14 gms. (1 level tbsp.)	49
Tapioca, Minute (raw)	14 gms. (1 level tbsp.)	49
Toast	one average slice of bread	80
Trout (edible portion)	100 gms. (1 serving)	164
Turnips (10% car.) cooked	100 gms. (2 heaping tbsp.)	39
Turkey	100 gms. (1 serving)	290
V		
Veal	2⅓ oz. (slice, 2 × 2¾ × ⅛ ins.)	100
Vegetables [2]		
W		
Walnuts, English (15% car.)	1 gm. (1 whole meat)	7
Walnuts, English (15% car.)	100 gms. (100 whole meats)	700
Water Cress (5% car.)	10 gms. (¼ cup)	7
Whey	184 gms. (1 glass)	50
Whisky (43% alcohol)	50 c.c.	152
White Fish (edible portion)	100 gms. (1 serving)	150

[1] For practical purposes, the milk sugar may be measured in a medicine glass. Each measured ounce equals 18 grams in weight. If milk sugar is added to water in the proportion of 24 grams to 3 c.c. and the water brought to the boiling point the milk sugar is completely dissolved. Such a solution made daily or just before use will be found convenient in administering the diet. (Coleman)

[2] Vegetables are listed under their various names.

Five per cent vegetables (cooked) "100 grams" are measured "2 heaping tablespoons," although weight in reality varies slightly.

Five per cent "thrice cooked" (boiled) vegetables are considered carbohydrate free.

For list of 5 per cent vegetables note page 370.

For list of vegetables and other foods in order of their carbohydrate content (from the lowest to highest) note page 368.

For list of vegetables and other foods arranged approximately according to per cent of carbohydrates note page 370.

CHAPTER IV

FEEDING THE SICK

GENERAL RULES

In the treatment of disease there are few questions which have to be considered so often in the daily routine of practice as those which concern the proper support and nourishment of the patient.

A good nurse will never exceed or depart from the physician's instructions; but there are occasions when her possession of accurate, even if limited, knowledge on the subject of chemical and physiological action of food will enable a physician to give more definite directions, greatly assisting him in the performance of his duties, and adding to the comfort and well-being of the patient.

Physician's Directions. The nurse's directions in reference to feeding her patient should be *written,* stating how much food may be given, its form, preparation and time of serving. In pneumonia, typhoid and all acute serious conditions, a record of all these details should be kept, also a record of the quantity of fluid and medicine taken.

The nurse has a far better opportunity than the physician to judge of all the conditions of the patient's digestion, and his likes and dislikes for different foods, and she should not fail to report them to the physician in charge and understand very definitely to what extent she is to be permitted to humor her patient, and substitute one form of food or drink for another.

It may happen from lack of care or indefinite instruction, that the food served will neutralize the effect of the medicine, either by overfeeding, or by irregularities in feeding,

which disturb digestion and interfere with the beneficial effect of the medicine.

Those who are ill are often allowed to drift into critical conditions through not being properly supplied with such nutritive material as their enfeebled powers can digest. Many have perished because those around them did not know how to feed them, and either withheld food altogether, or gave that which was unsuitable, through ignorance. Even when the patient is confined to bed and prevented from taking any kind of voluntary exercise, he still requires energy for the involuntary action of heart, lungs, and the other processes of living, and healthy nutrition must be provided for by a supply of suitable food.

Often the nurse may conscientiously serve one form of food ordered, offering it in spite of the patient's dislike and nausea with the result of half starving him. When her instructions have not been specific, or have not provided for emergencies, she should make it a point to have them clearly understood at the next visit of the physician.

To be able to carry out these instructions and offer nourishment intelligently, a thorough practical knowledge of dietetics is necessary, and should be the foundation of every nurse's training. If we wish to succeed in avoiding nausea, vomiting, loss of strength, and even loss of life, we must learn to offer food to the patient in a suitable form, in the quantity and at the times suited to his digestive power, and so adapt his food to his capabilities.

This subject has been so ably treated by Dr. Thompson (Practical Dietetics, 2d ed.) in his chapter, "Administration of Food for the Sick," that permission has been asked, and kindly granted, to use extracts from that chapter; also, by the kindness of Mrs. Ellen H. Richards, quotations have been made from the article, "Nourishment in Acute Disease," from the "Rumford Kitchen Leaflets."

Feeding in Acute Disease. The preparation of food for those who are seriously ill is a matter of vital importance, for the life of the patient often depends either upon the

maintenance of strength during the acute period of the disease or on the recovery of power during convalescence. Since acute disease is accompanied by fever, we must consider the effect of feeding in cases where the temperature is febrile in character; also the amount of food, its quality and quantity, together with other conditions affecting its absorption.

In acute disease accompanied by fever, what are the conditions? The body loses weight, urea is increased and carbonic acid and water are excreted in larger amounts than in health. All of this loss is not dangerous if permitted to go on for a few days only, and if the amounts do not exceed certain limits. But to replace these losses we are at a disadvantage as regards the ability of the system to assimilate food. In fevers the appetite is small, or may be completely lost. The saliva, the gastric juice, pancreatic fluid, the bile, are less efficient in action or diminished in amount during high temperature.

The stomach is very sensitive, in part, perhaps, through sympathy with the increased sensitiveness of the nervous system as a whole. If there is much hyperæsthesia of the digestive tract, as in typhoid, in peritonitis, in dysentery or gastro-enteritis, one must be careful not to give too much food at a time, and it should be in a liquid form and partially predigested. Note Typhoid Diet, page 337.

Evidences of Digestion. Our attention should be devoted not only to what is put into the alimentary canal, but also to what goes out. For instance, if curds of undigested milk are found in the stools of a typhoid patient, the quantity of milk should be diminished, or it should be diluted.

Every careful observer of the sick will agree that many patients are starved, simply from the want of attention to the means which alone make it possible for them to take food. For example, if the patient has a fever with remission and intermission, it is of the first importance to remember that the ability to digest food at these intermissions is greater, and it is then that the most nourishing portions of diet should be given.

It must be borne in mind that, contrary to the prevalent notion, the increase of body heat is not entirely responsible for the wasting of the fever patient. The emaciation is due partly to the inability to receive and digest the food, which in turn arises from the irritable state of the stomach and bowels and the defective secretion of the digestive fluids.

It is the administration of unsuitable food that must be guarded against, and also the giving of nourishment in quantities and at times unsuited to the digestive powers of the patient. All food is changed into liquid in the process of digestion before it can be absorbed into the blood. Liquid food, therefore, is given to the very sick because it can be digested with the smallest amount of labor to the body.

Predigested milk possesses the decided advantage in that it aids the assimilation of the milk without adding to its bulk, as do lime water and other substances.

By diluting milk, stimulants and gruels too much, the quantity of the fluid is so great that the patient soon tires of swallowing, and stops before enough nourishment has been obtained. One should not give what cannot be digested, nor less than can be assimilated. So the attendant must have a constant watch over the condition of the patient's powers of digestion, and it is necessary for her to know how to choose such variety in the diet as to include both what is palatable and what will afford a proper amount of nourishment.

The Appetite. As the appetite of the sick often requires tempting, the greatest pains should be taken in the preparation of the invalid's food. The lack of desire for food may be due merely to defective cooking, to the serving of meals at inopportune moments, or to the fact that the food selected is not to the patient's liking in kind, flavor, or appearance. A desire for food may exist, but not for the particular food offered, and it is the province of the nurse to differentiate.

Punctuality in serving meals should be carefully observed, for an appetite ready at the accustomed hour may fail if the meal is delayed. There is much unconscious habit in regard to eating. Time for cooking food should be carefully

considered with regard to the time for serving. Many foods properly cooked are spoiled by standing, which if served promptly would be delicious. The rule of serving food at stated intervals should be observed for the conscious as well as the unconscious or semi-unconscious patient.

Quality and Quantity of Food. All foods supplied should be as pure and fresh as possible. Hence for the sick it is desirable to select the best quality obtainable.

The amount should be regulated by the physician. When this is not done, care must be taken, on the one hand to see that sufficient is eaten, which often necessitates tempting the appetite; and on the other to avoid overindulgence if the patient is voracious or has a fancy for certain articles of which large amounts are likely to be harmful.

A well man, lying quietly in bed, requires from 1600 to 2000 calories per day, and if the body is being wasted by disease, he may need a great deal more. During convalescence, if the body has lost weight, food must be given for rebuilding, in addition to the ordinary daily need.

Temperature of Food. The temperature of the food served is exceedingly important, as it has a marked influence upon digestion. As a rule, foods to be served "hot" should neither be served lukewarm nor too hot. Serve in hot dishes and cover in transit. Cold food should be served neither lukewarm nor ice cold. Under many conditions food at extreme temperatures interferes with digestion and absorption.

Details in Feeding. The patient should be saved from thinking as well as from physical exertion, and it is unwise to ask him what he would like to eat, for it is often the unexpected that pleases. Personal idiosyncrasies should be considered; for some foods easy of digestion, if repugnant to the patient, may prove nauseating and be rejected or disturb digestion.

Only a small quantity of food should be given at one time so that the digestive organs may not be overtaxed. It is much better to do this often than to give too much at one time. A tablespoonful of nourishment every half hour may

be retained and digested, and do the patient good, when if a larger amount were given the stomach would reject it.

The majority of weak patients are unable to take food of any solid kind before eleven o'clock in the morning, yet before that time comes they are apt to become exhausted. This would not be likely to occur if a spoonful of some liquid nourishment or stimulant ordered by the physician were given every hour or two, from the early morning up to the time for taking the solid food, which the patient would then probably be able to do by noon.

All noise in the preparation of food and smell of cooking should be kept from the sick room. The nurse should never eat her meal or taste the patient's food in his presence, and should always have a cheerful manner and a cleanly, tidy appearance. These things have much effect upon the patient's appetite.

Bathing and Cleansing the Mouth. When possible, it is well to bathe the patient's face and hands before offering a meal. The mouth should be rinsed each time after eating with pure water, or diluted borax water (two teaspoonfuls to a tumbler of water). This takes away the after-taste of the food and he is less apt to tire of it.

The mouth should be kept thoroughly cleansed, for if the lips are allowed to become parched and sour, the patient will refuse nourishment which he might otherwise take. When a patient cannot rinse his own mouth it must be frequently cleansed by the nurse with a swab of fresh cotton, fastened to a small flexible stick. A tongue scraper made of a whalebone bent to a loop may be used before serving the food; thus the taste nerves will be uncovered and the appetite improved.

Time and Position for Feeding. When the patient is first allowed to sit up for half an hour, it is well to utilize this time for giving the principal meal of the day, which is likely to be eaten with more relish, and perhaps better digested in consequence. If the patient is only allowed to partially sit up in bed, the nurse should see that the position is com-

fortable, and that the food tray does not cramp the arms and legs, taking care that no crumbs get into the bed.

Sleep and Feeding. The awakening of a patient to take nourishment depends upon his need of the nutriment and upon his ability to go to sleep again. In serious cases it should be given at stated intervals if the patient drops to sleep easily after taking it. Some patients, however, are annoyed by being awakened and cannot sleep again. In such cases it may be that the sleep will be more beneficial than food.

Feeding the Helpless Patient. The effort of sitting up may become fatiguing to the invalid and so destroy his appetite before the meal is half done, or he may not be able to feed himself, or to raise his head. In such cases the difficulty can be obviated by placing the hand beneath the pillow and raising both together gently.

In feeding fluids at these times always serve in small tumbler, not more than two-thirds filled; see that swallows are not taken during inspiration, and that each mouthful is swallowed before another is offered. In case the head cannot be raised, food may be given by means of a glass tube or a feeding cup.

Feeding the Unconscious Patient. The feeding of unconscious patients demands especial care. They should be given only liquid nourishment, and fed with a spoon, or through a catheter. If the jaws are set, a medicine dropper may be utilized; not over a teaspoonful should be given at once, and the nurse must be sure it is swallowed before she gives more. In the case of comatose children, or young infants, the nourishment may be poured into the nostril in place of the mouth. Feeding with the stomach tube is sometimes resorted to, when nasal feeding is not feasible.

Forced Feeding. Forced feeding consists in introducing various liquid foods, as milk, eggs, meat-juice or extracts into the stomach by way of the nose or directly through the mouth by means of a stomach tube. This is seldom required of the nurse, but is usually done by the physician himself.

This method is employed when the unconscious patient experiences difficulty in swallowing; in gastric irritability; when a patient is unable to take sufficient food, owing to loss of appetite and disgust for food; and also in case of a refractory patient who refuses to eat.

Nasal Feeding. In nasal feeding a nasal tube is employed or in case of infant a catheter. Have either well oiled and passed gently through the nose into the œsophagus and then into the stomach. Before pouring in the food wait a moment to see that the tube has not entered the larynx.

Use of the Stomach Tube. The jaws must be kept open. In children without teeth, the finger may be employed; in grown persons a mouth gag or a roller bandage may be held between the teeth. The tube should be *moistened,* passed into the pharynx and thence *rapidly* into the stomach. If these two precautions are not observed, contraction of the muscles may occur, preventing the tube from entering the œsophagus. In passing the tube into the œsophagus, hold it well back from the end. When the tube is satisfactorily introduced, place a funnel in the free end and pour liquid nourishment slowly down the side of the funnel until the tube is filled, and the air in tube is expelled; this care prevents the air in tube entering the stomach. In removing the tube, it should be withdrawn rapidly in order not to excite vomiting. In some cases the physician orders the stomach washed out before introducing the food. When it is necessary to take special precautions to prevent regurgitation of the food, the ribs may be tickled to prevent contraction of the diaphragm.

Rectal Feeding. This form of alimentation is necessary when the stomach cannot retain food. It is based on the fact that the rectal mucous membrane, while it possesses no digestive faculty, is able to absorb certain classes of nutriment. These include among the carbohydrates, sugars; among proteins, the native albumin as well as the end products of protein digestion. The latter are believed to be much more absorbable than the first products (albumoses and peptones).

Soluble starch (dextrin) is doubtless absorbable, but unchanged starch and fats can hardly be taken up. It is probable that finely emulsified fats if thrown well up into the colon are absorbable to some extent. Although we cannot understand why certain substances nourish the patient, since they are theoretically not absorbable, they seem in some manner to be utilized, even when merely thrown into the rectum. As far as possible we should employ substances which we know positively to be capable of absorption; but in rectal feeding for a long period it is sometimes necessary to use a great variety of formulæ, making it out of the question to confine ourselves to the few articles which are theoretically best suited for the purpose.

The rectum may be intolerant to almost any form of enema; even if retained for some time, it may be rejected without apparent change. Under the most favorable circumstances, at least three-fourths of the quantity injected will come away with the regular evacuation of the bowels. The amount of energy actually supplied must be far below the theoretical demands of the body. In some cases, it is of course possible to nourish the patient partly by the mouth and partly by rubbing a small amount of fatty matter into the skin. Some of the most available substances, such as solutions of sugar, are naturally irritating to the rectum.

It is possible to keep a patient alive for weeks and even months by rectal feeding, but in many cases this resource for one reason or another fails outright to do what is expected of it. Hence we cannot be too careful as to technique and choice of material used. Of natural substances, milk and eggs have been very freely used. The albumin and sugar in the milk are probably utilized. In an emulsion of eggs, the native albumin is doubtless the constituent which nourishes the patient. We cannot be sure of the absorption of the fatty matter of the milk and eggs. Both these substances are relatively non-irritating. Peptonized milk answers well in some cases. It is best to carry on the peptonization for a long period, until the end products of digestion form, pep-

tones themselves being often irritating. Solutions of glucose and dextrin are useful, alone or combined with other ingredients. For example, eggs may be combined with glucose, or plain milk with dextrin. For variety, any of the predigested foods, whether these come in solution or dried, and even bouillon and beef-tea may be tried. Starch emulsion is soothing in the rectum and may be utilized if first mixed with diastase.

The technique is most important. The rectum should first be cleaned by a high injection of decinormal saline solution, after which no attempt should be made to give a nourishing injection for at least an hour. It may be necessary for the physician to treat the rectum if hemorrhoids or great irritability exists. The patient's hips should be raised higher than the head to aid in retaining the enema. A tube specially designed for the purpose should be used, the enema being at body heat and allowed to flow in by gravity from a funnel. The amount injected should never exceed 8 oz. and the enema cannot be repeated oftener than every 6 hours unless the quantity is small. As a rule, the smaller the enema the more frequently it may be used. After an injection the patient should be kept perfectly quiet.

Stimulants like black coffee and whisky are often given by the rectum, the whisky requiring dilution with two parts water. Wine is sometimes used for the purpose. Stimulating and nutritive enemata may be combined.

Injections of normal salt solution, seltzer water, etc., are sometimes used to supply the body with fluids and quench thirst.

Useful additions to enemata comprise a little salt or sodium bicarbonate or a little starch emulsion; at times a few drops of laudanum are of value in aiding retention.

One should not be discouraged by early failure, as it is possible for tolerance to be established.

FORMULAE FOR RECTAL FEEDING

I. Peptone-milk, Von Leube

250 c. c. milk .... = 170 Cal.
60 c. c. peptone .... = 100 Cal.

II. Egg-milk, Von Leube

250 c. c. milk .... = 170 Cal.
3 eggs .... = 200 Cal.
3 gms. salt.

III. Starch-milk, Von Leube

250 c. c. milk .... = 170 Cal.
70 gms. starch .... = 250 Cal.

IV. Sugar-milk, Von Leube

250 c. c. milk .... = 170 Cal.
50 gms. grape sugar .... = 250 Cal.

V. Pancreas, Von Leube

75 gm. pancreas substance .... = 300 Cal.
225 gm. beef .... = 300 Cal.
35 gms. fat .... = 350 Cal.

(This enema, in semi-solid condition, is introduced into the rectum and allowed to digest therein. A piston syringe with a wide nozzle is required.)

Nutrient Enema:

Peptonised Milk .... ℥ iv to ℥ vi (four
Whites of two eggs .... to six ounces)
Above used Per Rectum every two to four hours.

Nutrient Enema:

Milk ....℥ i (one ounce)
German Seltzer H_2O ....℥ iv (four ounces)
Used in Icterus, every two hours.

Nutrient Enemata—Malted Milk.

Dissolve from three to four heaping teaspoonfuls of Horlick's malted milk powder in one-half pint of water, to which add one-half teaspoonful of salt. Use at body temperature, or two or three degrees higher.

The white of one egg may be incorporated if desired.

Four to six ounces used per rectum every two to four hours.

Stimulating Enema:

Black Coffee .... ℥ iv (four ounces)
Whiskey .... ℥ ii (two ounces)

Salt Solution:

Sodium chloride	ʒ i (one drachm)
Aquae	O i (one pint)

Use of Alcohol in the Sick Room. The nurse may be required to exercise her own judgment at times in the emergency use of alcoholics in the sick room. This necessity is most likely to occur with those patients having incurable maladies where the question of harm to the organism or to the morals of the individual does not come into consideration. Consumptives often show a remarkable tolerance to alcohol, and receive a notable stimulating effect from it, and it sometimes happens that an eggnog or milk punch will enable an advanced consumptive to dress and make his toilet in the morning when otherwise he would have to lie in bed. This is true to a less extent of some other incurable diseases. Severe acute or subacute conditions in which an alcoholic stimulant might require to be given in preference to any other for its emergency effect in averting unlooked-for cardiac failure comprise pyemia, septicemia and diphtheria. In the same class belong certain cases of acute poisoning due to mistakes or suicidal intent, such as those due to aconite and similar heart poisons. The propriety of giving alcoholics after simple collapse or syncope when no serious disease is present depends upon the nature of the case and whether other stimulants are available.

Alcohol should perhaps never be given even in emergencies to subjects with neurosis or insanity or to victims of severe disease of the gastrointestinal organs.

Keeping Ice in the Sick Room. The very best plan is to have a small refrigerator or a Japanese ice box, which may be had for a few dollars. If these little luxuries are impossible, put the ice in a deep bowl, cover it with a plate, and place the bowl between two clean feather pillows. Another simple way of keeping ice is to put it in a dish pan, cover with a tin lid, and wrap in flannel cloths and newspapers. It will keep a long time, as feathers, wool and paper are poor conductors of heat.

Disinfecting Utensils. All dishes or utensils used in the sick room should be disinfected before being sent to the kitchen to be washed. A simple method is to scrape them clean and dip them in a basin of borax water (a teaspoonful of borax in a shallow bowl of water). In case of infectious diseases all dishes and utensils should be boiled in water containing 3 per cent. of sodium bicarbonate for one-half an hour to one hour.

CHAPTER V

THE TRAY

The writer's intention is only to suggest to the nurse the best and simplest methods of arranging the tray and a few of the important details.

These things seem trivial, but it must be remembered that the horizon of the sick room is limited, and that the patient who has long been confined to bed with a serious illness thinks much of his immediate surroundings.

He may seem too ill to notice these details, whereas he is only too ill to speak of them, for one feeds with the eyes quite as much as with the lips, and by some carelessness of the nurse the appetite of a refined, fastidious, or nervous patient may be wholly destroyed.

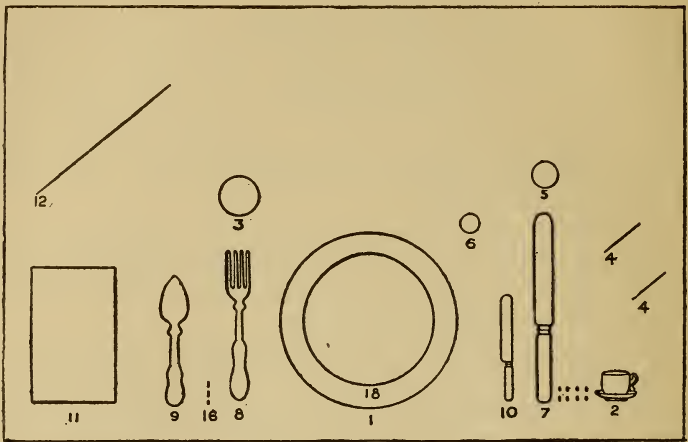
While the natural stimulants to appetite, such as fresh air, exercise and enlivening companionship, are necessarily wanting, the taking of food is the chief event of the day, and too much care cannot be bestowed upon its preparation and service, as, has been said, the appearance and manner of offering have much to do with its acceptance or rejection.

ATTRACTIVE ARRANGEMENT OF A TRAY

The cover and the arrangement of the tray is of the utmost importance, and the slightest departure from regularity and immaculate cleanliness should be avoided.

The tray should be covered with fine linen damask, without crease or wrinkle — the best you can afford. Use the choicest silver, daintiest china and glassware; arrange neatly and conveniently. Place a single rose or flower on the tray; a quotation, added as a variety, will often attract the attention, and it is well, when possible, to divert the patient's

mind from his ailments while eating. This can easily be done in these little ways, and also by the introduction of some cheerful and interesting topic of conversation.



Proper Placing

1 Plate.
2 Cup and saucer.
3 Bread and butter plate.
4 Individual creamer and sugar.
5 Tumbler.
6 Individual salt.
7 Knife.
8 Fork.
9 Spoon.
10 Butter spread.
11 Napkin.
12 Flowers.

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13 Salad knife.
14 Soup spoon.
15 Oyster fork.
16 Salad fork.
17 After coffee spoon.
18 Soup or cereal or berry plate, etc.

N.B.— The dots between numbers 7 and 2 reading from left to right represent numbers 13, 14, 15, and 17. Sharp edge of knife turned toward plate; tines of forks, bowl of spoons, all dishes and tumblers placed right side up.

How to Serve. (General Rules.) The time of cooking food to be served, should be carefully considered in relation

to the time of serving, for most palatable food may be spoiled by not serving it at the proper time.

Avoid serving too many things on tray. Cover tray with a clean napkin or tray cover in carrying it to its destination. When the dietary ordered is very limited in variety, the patient is often gratified by having his food served in courses, and will eat more than if given everything at once.

Only a small quantity should be served at one time. If possible, taste of all food and drinks before serving, to see if properly seasoned and at right temperature to serve.

Always use separate spoon for tasting.

Food to be served hot, should be served *hot* (not lukewarm), in heated dishes and covered in transit.

Cold drinks and fruits are more healthful when served cool than ice-cold.

When fluid foods are to be given, other receptacles should be used than those used for medicine, or the association of ideas may be strong enough to destroy what little appetite the patient has, and to even produce nausea. Do not fill cups or glasses full, but within one inch of the top. For individual dishes, for a luncheon, or drinks to be passed alone, use a small tray or plate, covered with a doily or folded napkin.

The finger-bowl should be placed on a small plate, covered with a dainty doily; fill one-fourth full of water, and put a few rose petals or green leaves in the water and on the side of the plate.

When possible, cover all foods and drinks left standing in the sick room.

The tray and all traces of a meal should be removed immediately after eating. Half-emptied cups or glasses should never be left in the room.

If the patient is restricted to any especial diet, vary as far as possible in the preparation and serving.

The diet of the patient should be under the supervision of the physician, and his directions followed implicitly, for much unnecessary suffering, and even death, has been the result of giving forbidden food.

CHAPTER VI

METHODS OF COOKING AND CARE OF FOOD

Cooking is the preparation of food for eating.

Digestibility and Nutritive Value of cooked food depends to a considerable extent upon the manner in which it is cooked and served. The time and temperature of cooking should be carefully considered, in relation to the constituents of the food material.

Success in Cooking depends in part upon the quality of material used, which should be the best. The measurements must be accurate. Care should be exercised in combining ingredients and one should know the effect of various modes of cooking on the food under consideration. Training and experience are necessary for success.

Objective Points in Cooking:

1. To improve the flavor of food, or render it more palatable.

2. To soften it that it may be more readily masticated and digested.

3. To produce chemical changes which increase digestibility.

4. To destroy bacteria and parasites which may be present in raw food.

Effects of Heat. Protein is coagulated by hot water and dry heat; cold water dissolves soluble proteins, especially if a little salt is present.

Starch is converted into dextrin by dry heat at a temperature of 320° F.; the starch granules dissolve when subjected to boiling water; cold water separates starch grains.

Sugars are changed to caramel at a high temperature.

Fats are readily decomposed by heat, with production of free fatty acids.

Principles Governing the Choice of a Method of Cooking Any Food. These include: (1) A knowledge of the effects of heat and moisture on the digestibility of the articles to be cooked. (2) The relation of the method to the extraction of soluble portions of the food materials.

Principal Cooking Processes:

1. Boiling is cooking in boiling water (212° F.). Gentle boiling is as effective as rapid, and prevents waste of fuel if gas is used.

2. Stewing is long, slow cooking in water below the boiling point — 186° F.

3. Steaming is cooking in heat derived from the vapor of boiling water. The steam enters the cooking compartment and comes into contact with the food cooked.

4. Broiling is cooking over a glowing fire or over or under a flame. Pan broiling is cooking meat in a very hot frying-pan without fat, turning the meat often.

5. Baking is cooking in an oven by means of heated air. Roasting is cooking before a glowing fire (direct heat).

6. Frying is cooking in a deep bath of hot fat (temperature ranging from 350° to 400° F.).

Other methods are used which differ but slightly from the above. Braizing is a combination of stewing and baking; fricasseeing of frying and stewing.

The Object of Each Cooking Process:

1. To retain the juice as in boiling, steaming, broiling, baking, roasting, frying.

2. To extract the juices as in soups.

3. Partly to retain and partly to extract the juices as in stews, chowders, braising, and fricasseeing.

Cooking Utensils. A nurse should always have at hand a standard measuring cup, divided into thirds and fourths. Wooden spoons are preferable to metal ones for mixing and

stirring, as metal spoons are too hard and may break off bits of enamel, and are also acted upon by acids. For beating egg-white, a spoon-shaped wire beater should be used; for the yolks, a fork or Dover egg beater is preferable. Use round bottom utensils when stirring is necessary during the cooking. Use earthen bowl and wooden spoons for mixing batters, etc. A double boiler should be used when cooking any food that burns easily (as milk); also when foods are to be cooked at low temperatures.

Blending Ingredients. There are several ways of accomplishing this purpose.

1. Stirring. This is simple mechanical mixing in which a mass of ingredients is made uniform.

2. Beating or whipping consists in so manipulating a soft mixture as to incorporate the air. A spoon or special device is so applied that the bottom of the mixture is steadily lifted to the top.

3. Folding-in is a term applied to the method of introducing beaten white of egg slowly and gently into a soft mass, so as to render it light, the air being retained.

4. Cutting is used only in making pastry. Two knives are worked in opposite directions until the shortening is well incorporated in the flour.

Suggestions as to Methods of Working. If a fire and oven are to be used these must be first of all attended to that they be in readiness when needed. All the cooking apparatus should be laid out and the materials to be cooked measured in preparations for mixing. It is advisable to be economical in the use of utensils. Thus one measuring cup may sometimes be used in succession for dry materials, liquids and fats, in the order named. A receptacle should be at hand for soiled spoons and other utensils employed in measuring or mixing. It is desirable to work as much as possible in a small space; thus the measuring and mixing should be done on a single table if possible. All soiled dishes should be put to soak; at odd moments they may be washed, dried and put away. The purpose underlying these principles is that the

nurse may go into the family kitchen and prepare food for the patient without in the least interfering with the regular kitchen work of the household.

Ice Box and Contents. The ice box should be maintained in a state of absolute cleanliness. This is not difficult in the case of a simple portable refrigerator without a drain pipe, which may be flushed out daily with boiling water containing borax or ammonia (half ounce to the gallon). However, in the larger kinds of portable refrigerators, and in the set ice boxes where a tube is necessary for drainage, all the compartments and shelves should be washed with soap and hot water at least once in a week, while every day loose particles of food which have escaped from dishes, etc., should be carefully removed; or if advisable in certain cases, the food and shelves may be removed and wiped or brushed off. The drainage pipes must be cleaned with a brush made for the purpose at least once a week. It is advisable to sprinkle borax on the shelves after cleaning. Certain pungent articles can not be kept in an ice box without flavoring other foods such as butter, milk, etc.

Institutions, if large enough, may use a refrigerating plant, which does away in part with the handling of ice; or by the aid of an ice machine, superintendents may assure themselves of the purity of all ice designed for internal use.

The drain pipe of an ice box should not, for obvious reasons, communicate with the sewerage system.

The temperature in the food compartments is sometimes much warmer than one would imagine; and it is desirable to get some idea of what the temperature fluctuations are by using a thermometer. The reading can hardly go lower than 40° F. and should not be over 60° F.

The ice cake should be wrapped in cloth or paper, not only for economy's sake but because it may be dirty inside or outside. No food should be placed in the box while warm, for the sudden cooling may set up undesirable changes. Canned food should not be placed on ice in the opened can, but in a fresh receptacle. When possible, each article should be

placed in a separate container, or wrapped in paper. Moisture in the ice box, while unavoidable, should be kept down by wiping walls and shelves dry at intervals.

CARE OF FOOD [1]

The care of food between the time of purchase and cooking, and that of cooking and serving is highly important. The fact that spoiled food represents an economic loss, important as it is, is much less significant than the fact that not only spoiled food, but good food which is contaminated with germ life, is a possible source of disease.

Exposed food, i. e., food exposed to dust, insects, etc., becomes contaminated with disease germs without necessarily becoming spoiled or in any way offensive to the senses. The most crisp salad or luscious fruit may be covered with dangerous microörganisms.

By far the most frequent and abundant forms of microorganisms, which grow at such rate as quickly to become visible to the naked eye, are molds. These are not on the whole harmful to man, and their chief significance is that they give to foods a bad flavor and cause a certain amount of decomposition. These organisms attack food which is stored in dark, damp places, chiefly cellars, and although themselves generally harmless, they are likely to be associated with poisonous bacteria. Certain butchers hang steaks until they become covered with mold, but the mold does not make the meat tender and highly flavored, for these changes are due largely to the bacteria of putrefaction which are also present, thriving under the same conditions as does the mold.

In case of substances which have a natural protective covering, it is highly important that this should not be broken in handling. Thus when fruits and vegetables are bruised, the pulp is quickly attacked by microörganisms and local changes occur, resulting in economic waste, since such articles can only be partly utilized.

[1] For further information, note "Care of Food in the Home." Farmers' Bulletin, No. 375 U. S. Dept. of Agriculture, Washington, D. C.

Foods should therefore be stored in places which admit plenty of sunlight and air, which will antagonize the growth of molds and putrefactive bacteria. Ice, by producing temperatures unfavorable for the growth of microörganisms, is a valuable aid in this sort of cleanliness. Some use of soap and water is necessary, but the benefits are partly lost if the shelves, etc., are left damp. In cellars repeated whitewashing is the most available resource for cleanliness.

Food should be bought in the freshest and cleanest state, should be placed in clean containers, and handled with clean hands. Foods should always be washed if there is any suspicion of contamination. The cases of violent cholera morbus which often follow the use of unripe apples, and even of ripe fruit like cherries, are believed to be due not to the irritating acids present in fruit, but to the presence of a well-known bacterium mingled with the dust which collects on such fruit. To be absolutely on the safe side, all fruits and vegetables should be eaten cooked, but this would deprive us of salads and fresh fruits and berries which form so large and pleasurable a part of the average dietary. It has been found by experience that if celery, greens, asparagus, berries, etc., are washed repeatedly in cool or tepid water, they can at last become quite clean without losing their delicate flavor and consistency. As long as a particle of grit is present there is of course possibility of contamination by living organisms. They should be washed, therefore, until the wash water is clear. This is a rule which applies to all food that is to be eaten raw. With cooking such caution is not absolutely necessary. Potatoes, etc., are washed before boiling for esthetic reasons only.

The worst cases of food poisoning, known as ptomaine poisoning, are mysterious in character, and are not entirely preventable. Chemical substances not usually formed in simple decomposition are responsible. They may be present alike in raw, cooked, or frozen foods, and in fresh and preserved foods. In some cases there is abundant evidence of extreme decomposition. The use of rotten eggs in cookery by bakers

has caused severe ptomaine poisoning. Cold storage meats are sometimes responsible. Fish poisoning, especially with shell fish, may be due to some unknown disease of the animals themselves (although fish very readily undergo decomposition), and personal susceptibility is often a factor. The numerous cases of ice cream poisoning are usually due to mistakes of amateurs who do not understand the proper requirements of the art. Although we do not understand and cannot always foresee ptomaine poisoning, it is the more important that no step be neglected which will contribute in theory to securing clean food. Most cases occur in prolonged warm weather in which decomposition is favored. Sound, fresh food, thoroughly cooked and eaten at once could hardly cause ptomaine poisoning under any conditions.

The articles which the ordinary careful nurse must think of in this connection are preserved foods of all kinds, shell fish, and milk products, the latter being of most significance, because milk, fresh cream, ice cream, etc., are often given freely to invalids. The care of milk, drinking water and other kinds of food is considered elsewhere.

Special care of food in respect to fly pollution has become necessary since we have learned of the part played by this insect in causing typhoid fever, cholera, dysentery, etc. Both the feet and the excrement of flies are sources of contamination. Dealers in food-stuffs in the main take but little pains against protecting their wares from fly contamination. Cooking and careful washing of food to be eaten raw, are our principal safeguards in respect to food as it reaches the house. There is the added danger that food when ready for consumption will be freshly contaminated. To obviate this, doors and windows of kitchens and dining rooms must be properly screened, and flypaper and similar precautions employed. If typhoid is epidemic in a neighborhood, it is well to avoid raw food entirely, just as we avoid unsterilized water and milk. Flies are much more likely to abound in neighborhoods where manure, garbage, etc., are allowed to accumulate, and are more dangerous than ordinary dust.

Dealers usually are at some pains to keep their supplies free from dust, though their methods are not always sanitary, e. g., the use of the feather duster for fruit. Dust from the streets of cities abounds in germ life. Vegetables and certain fruits in clusters which cannot be wiped (grapes, currants, etc.) are most likely to be dusty. Washing successively in a number of waters will usually remove the dust; but in the tropics where many diseases are dust-borne it is not considered safe to eat raw grapes at all. Whether washing is sufficient depends on the character of the dust and the degree of exposure to it.

Preserving Foods. Foods to be preserved should be perfectly fresh. Yeo gives four methods of preservation:

(1) Drying is the method most available for preserving peas, beans, prunes, apricots and other fruits. Milk and eggs may both be preserved by desiccation.

(2) Exclusion of air may be applied in several ways. Smoking, which coagulates the outer surface and sterilizes it, serves for preserving ham, bacon, fish, etc. Packing in sawdust, etc., or dipping in wax preserves eggs. Canning in tins or jars under steam heat is used for preserving many kinds of food, all air thus being forced out before the can or jar is hermetically sealed.

(3) Freezing and cold storage are used extensively for preserving fish, meat, jams, etc. Such foods must be cooked immediately upon thawing.

(4) Antiseptics are used very extensively in food preservation. The oldest and most widely known of these are salt, vinegar, alcohol and syrups. More recently a great variety of antiseptic chemicals have been used — benzoate of soda, salicylic acid, etc., etc. The advisability of their use, even in minute quantities, is questionable.

Concentration. Most foods can be reduced to a dry or otherwise condensed state without loss of nutritive value or danger of decomposition; and on account of the resulting economy in price and storage room may enter into the dietaries of hospitals and institutions. Sugar, oil and starch, and

many cereal products, are already in a state of concentration. Powdered milk and meat, egg powder, etc., are coming more and more into use. Condensed milk has long been a useful product (see milk and milk preparations), as have dried and evaporated fruits and vegetables. All these products can be used in cookery. Their chief use as mainstays will doubtless be in cases of temporary shortage of fresh foods, due to devastating storms, "strikes" and other happenings which interrupt traffic.

Predigestion of Food. Much is written against the use of predigested foods as a steady diet for the well. Many starchy foods on the market are partially digested by heat. The objection seems to rest on the theory that such foods give the digestive fluids and muscles of the digestive organs nothing to do, and that a sort of sluggishness is set up. It cannot be said truthfully that these claims have ever been backed up by facts. No one denies that thorough mastication is a great advantage, and with thorough mastication much of the starch is predigested in the mouth, or, after swallowing, in the fundus of the stomach. Predigested proteins are not used as staple foods, and as little is gained by very finely masticating flesh foods, the stomach has plenty of work in digesting animal proteins. If there is fat in the diet the pancreas can never fall into a state of disuse. Hence the outcry against partially predigested breakfast foods does not seem justified on this score. It is true, however, that their absence of flavor, and the soft and pulpy character of some of them are recognized as possible drawbacks; for semi-solid and pultaceous foods are difficult to masticate, while their insipidity does not flavor a flow of digestive fluids. If adherence to these foods causes sluggish digestion and inability to deal with food in more natural condition, one would impute this not to predigestion, but to the fact that the tastelessness and the ease with which they may be bolted, are the real factors which bring about a passive state of the digestive functions.

In a diet for the ill, the dyspeptic, the convalescent, etc., there can be no possible objection to predigestion; on the contrary, it is highly desirable up to a certain extent. But just as soon as possible the patient should return to foods in the natural state, bearing in mind that a small minority of cases, even the acutely ill, thrive on food which in theory would be hazardous to say the least. Apparently hopeless cases of sepsis have seemingly been rescued by placing patients on food suited only for the healthy. Such patients must, however, have a natural appetite and be able to tolerate the food.

Adulteration of Food. "Since the passage of the National Pure Food and Drugs Act, giving to the United States Government authority to enforce stringent laws against the adulteration and misbranding of foods which enter into interstate commerce, and the more rigid enforcement of similar state laws which regulate these matters in many of the states, a great burden has been lifted from the shoulders of the buyer. This legislation has enormously decreased the deceptions formerly practiced by some manufacturers, and since it insures that the name and description on bottle and package shall not misrepresent the contents, the buyer, if he knows what he wants, will have no difficulty in obtaining it, while the honest manufacturers and dealers (and they have without doubt always outnumbered the others) will also be protected. This matter in its various aspects is taken up in publications of the Bureau of Chemistry [1] of this Department." [2] For Table of Common Adulteration of Foodstuffs, note Farmer's Bulletin No. 25, of the United States Department of Agriculture, Division of Chemistry, Washington, D. C.

[1] U. S. Dept. Agriculture Bureau of Chemistry, Bulletin 100; Year Book 1907, p. 321.

[2] U. S. Dept. Agriculture. Bureau of Chemistry, Bulletin 325, p. 19.

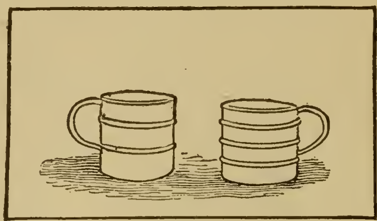
CHAPTER VII

MEASURES AND WEIGHTS

Accurate measurement is necessary to insure success in cooking.

All dry ingredients, such as flour, meal, confectioners' or powdered sugar, should be sifted before measuring.

Mustard, cream of tartar, soda, and salt should be stirred before measuring, to lighten and free from lumps.



A Standard Measuring Cup

A standard measuring cup contains one-half pint and is divided into fourths and thirds.

To measure a cupful of dry material, put in the ingredients by spoonfuls, round slightly and level with back of case-knife, being careful not to shake cup.

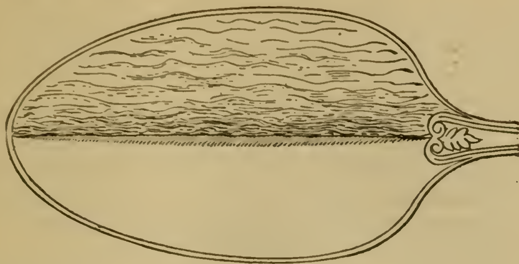
A cupful is measured level with the brim.

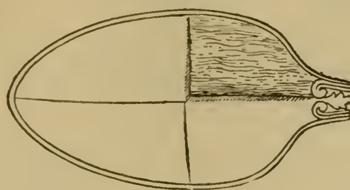
A heaping cupful is measured level, with two table spoonfuls extra added.

A scant cupful is measured level, with two table spoonfuls taken out.

All ingredients measured by the tablespoon or teaspoon are measured level.

To measure a spoonful, fill the spoon and level it off with the back of case-knife.





To measure a half-spoonful, first measure a spoonful and then cut it in halves, lengthwise.

To measure a quarter-spoonful, measure a half-spoonful and divide it into half, crosswise, allowing a little more for tip of spoon.

A saltspoon is one-fourth of a level teaspoon.

A speck is a little less than one-eighth of a teaspoon.

To measure butter, lard, and other solid fats, pack solidly into spoon or cup and level with knife.

When recipe calls for one tablespoon (or so) of *butter melted,* measure before melting. When recipe calls for one tablespoon (or so) of *melted butter,* measure after melting.

TABLE OF MEASURES AND WEIGHTS

4 saltspoons	= 1 teaspoon, tsp.
3 teaspoons	= 1 tablespoon, tbsp.
4 tablespoons	= ¼ cup or ½ gill.
16 tablespoons (dry ingredients)	= 1 cup, c.
16 tablespoons (liquid)	= 1 cup.

2 gills	=	1 cup.
2 cups	=	1 pint.
2 pints	=	1 quart.
4 quarts	=	1 gallon.
2 tablespoons butter	=	1 ounce.
1 tablespoon melted butter	=	1 ounce.
4 tablespoons flour	=	1 ounce.
2 tablespoons granulated sugar	=	1 ounce.
2 tablespoons liquid	=	1 ounce.
2 tablespoons powdered lime	=	1 ounce.
1 cup of stale bread crumbs	=	2 ounces.
1 square Baker's unsweetened chocolate	=	1 ounce.
Juice of one lemon = (about) 3 tablespoons		
5 table spoons liquid	=	1 wineglassful.
4 cups of sifted flour	=	1 pound.
2 cups of butter (packed solid)	=	1 pound.
2 cups of finely chopped meat (packed solidly)	=	1 pound.
2 cups of granulated sugar	=	1 pound.
$2\frac{2}{3}$ cups of powdered sugar	=	1 pound.
$2\frac{2}{3}$ cups brown sugar	=	1 pound.
$2\frac{2}{3}$ cups oatmeal	=	1 pound.
$4\frac{3}{4}$ cups rolled oats	=	1 pound.
9 to 10 eggs	=	1 pound.
1 cup of rice	=	$\frac{1}{2}$ pound.

APOTHECARIES WEIGHTS

20 grains	=	1 scruple, ℈
3 scruples	=	1 drachm, ʒ
8 drachms (or 480 grains)	=	1 ounce, ℥
12 ounces	=	1 pound, lb.

APOTHECARIES MEASURES

60 minims (♏)	=	1 fluid drachm, fʒ
8 fluid drachms	=	1 fluid ounce, f℥
16 fluid ounces	=	1 pint, O or pt.
2 pints	=	1 quart, qt.
4 quarts	=	1 gallon, gal.

APPROXIMATE MEASURES

One teaspoonful	equals about 1 fluid drachm.
One dessertspoonful	equals about 2 fluid drachms.
One tablespoonful	equals about 4 fluid drachms.
One wineglassful	equals about 2 ounces.
One cup (one-half pint)	equals about 8 ounces.

METRIC SYSTEM

For the origin and underlying principles of the metric system consult any modern arithmetic (Milne's Standard, for example). The nurse should know the metric tables and the equivalents between the metric and common systems for measures of volume and weight. She does not require linear and square measure, nor measures of capacity except in a few instances.

The subjoined tables and equivalents will suffice.

TABLES

Measures of Volume

In measuring small quantities the cubic centimeter is the unit.

1 cubic centimeter	=	1.0	cc.
10 cubic centimeters	=	10.00	cc.
1 cubic millimeter	=	0.1	cc.
1-100 cubic millimeter 1-1000 cubic centimeter	=	0.001	cc.

etc., etc.

MEASURES OF WEIGHT

In measures of weight the gram is the unit.

1 gram	1.0	gm.
1 decigram	0.1	gm.
1 centigram	0.01	gm.
1 milligram	0.001	gm.

TABLE OF EQUIVALENTS

Appended is a table of all the denominations of weights and measures, opposite which are placed the metric system, with corresponding equivalents in wine measure and avoirdupois weights:

LIQUIDS	APPROXIMATE EQUIVALENT	EXACT EQUIVALENT
1 minim	0.06 Cubic centimetre	0.061 Cc.
1 fl. drachm	4 Cc.	3.696 Cc.
1 fl. oz.	30 Cc.	29.574 Cc.
4 fl. ozs. or ¼ pint....	118 Cc. (⅛ Liter)	118.295 Cc.
8 fl. ozs. or ½ pint....	236 Cc. (¼ Liter)	236.590 Cc.
16 fl. ozs. or 1 pint....	473 Cc. (½ Liter)	473.197 Cc.
2 pints	1 Liter (1000 Cc.)	.946 Liter.
4 pints or ½ gallon...	2 Liters.	1.892 Liters.
1 gallon	4 Liters.	3.785 Liters.
1 Cubic centimeter.	16 minims.	16.23 mins.
4 Cc.............	1 fluid drachm.	1.082 fl. drs.
15 Cc.............	½ fl. oz. (4 fl. drs.)	4.057 fl. drs.
25 Cc.............	6¾ fl. drs.	6.762 fl. drs.
30 Cc.............	1 fl. oz.	1.014 fl. ozs.
60 Cc.............	2 fl. ozs.	2.029 fl. ozs.
100 Cc.............	3⅓ fl. ozs.	3.381 fl. ozs.
120 Cc.............	4 fl. ozs. (¼ pint)	4.057 fl. ozs.
125 Cc.............	4¼ fl. ozs.	4.227 fl. ozs.
235 Cc.............	8 fl. ozs. (½ pint)	7.945 fl. ozs.
250 Cc.............	8½ fl. ozs.	8.453 fl. ozs.
300 Cc.............	10 fl. ozs.	10.144 fl. ozs.
470 Cc.............	1 pint.	15.892 fl. ozs.
500 Cc.............	1 pint 1 fl. oz.	1.056 pints.
950 Cc.............	2 pints.	2.007 pints.
1000 Cc. (1 Liter)....	2 1-10 pints.	2.113 pints.
4 Liters	1 gallon.	1.056 gals.

SOLIDS	APPROXIMATE EQUIVALENT	EXACT EQUIVALENT
1-500 grain	0.00013 Gm.	0.000129 Gm.
1-150 gr.............	0.00043 Gm.	0.000432 Gm.
1-120 gr.............	0.00054 Gm.	0.000540 Gm.
1-100 gr.............	0.00065 Gm.	0.000648 Gm.
1-64 gr.............	0.001 Gm. (1 milligramme.)	0.001013 Gm.

SOLIDS	APPROXIMATE EQUIVALENT	EXACT EQUIVALENT
1-50 gr.	0.0013 Gm.	0.001296 Gm.
1-40 gr.	0.0016 Gm.	0.001620 Gm.
1-32 gr.	0.002 Gm.	0.002025 Gm.
1-25 gr.	0.0026 Gm.	0.002592 Gm.
1-10 gr.	0.0065 Gm.	0.006479 Gm.
1-3 gr.	0.021 Gm.	0.021599 Gm.
1 gr.	0.065 Gm.	0.064798 Gm.
5 grs.	0.3 Gm. (3 decigrammes.)	0.324 Gm.
15 grs.	1 Gm.	0.972 Gm.
30 grs.	2 Gm.	1.944 Gm.
60 grs.	4 Gm.	3.888 Gm.
⅛ oz.	3.5 Gm.	3.544 Gm.
½ oz.	14.2 Gm.	14.175 Gm.
1 oz.	28 Gm.	28.350 Gm.
2 ozs.	56 Gm.	56.699 Gm.
¼ lb.	113 Gm.	113.398 Gm.
½ lb.	225 Gm.	226.796 Gm.
1 lb.	450 Gm.	453.592 Gm.
2 lbs.	900 Gm.	907.185 Gm.
1 milligramme (0.001 Gm.)	1-65 grain.	0.015 grain.
10 milligrammes (0.01 Gm.) (= 1 centigramme.)	1-6 gr.	0.154 gr.
100 milligrammes (0.1 Gm.) (= 1 decigramme.)	1½ grs.	1.543 grs.
1 Gramme	15½ grs.	15.4324 grs.
4 Gm.	60 grs. (1 dr. Troy)	61.729 grs.
10 Gm. (1 dekagramme)	⅓ oz.	154.324 grs.
25 Gm.	⅞ oz.	385.81 grs.
28 Gm.	1 oz. (437½ grs.)	432.107 grs.
56 Gm.	2 ozs.	1 oz. 426.7 grs.
100 Gm. (1 hektogramme)	3½ ozs.	3 ozs. 230.7 grs.
113 Gm.	4 ozs. (¼ lb.)	3 ozs. 431.3 grs.
200 Gm.	7 ozs.	7 ozs. 24 grs.

SOLIDS	APPROXIMATE EQUIVALENT	EXACT EQUIVALENT
225 Gm.............	8 ozs. (½ lb.)	7 ozs. 410 grs.
250 Gm.............	8⅘ ozs.	8 ozs. 358 grs.
450 Gm.............	1 lb. (7000 grs.)	15 ozs. 382 grs.
500 Gm.............	1 1-10 lbs.	1 lb. 1 oz. 279 grs.
900 Gm.............	2 lbs.	1 lb. 15 ozs. 327 grs.
1000 Gm. (1 kilogramme or Kilo)	2⅕ lbs.	2 lbs. 3 ozs. 120 grs.

TABLE FOR PREPARING PERCENTAGE SOLUTIONS

Public Charities and the Department of Bellevue and Allied Hospitals [1]

One fluid ounce of water, or 480 minims, weighs 456.4 grains. One pint of water, or 7680 minims, weighs 7300, or practically 7300 grains. Hence, a 10 per cent. solution, for instance, is one which contains 730 grains of some substance in 1 pint.

The following table will show at a glance the quantity of any substance, *by weight,* required to prepare *one pint* of a solution:

1. *To Prepare One Pint of a Solution*

REQUIRED TO CONTAIN OF A CERTAIN SUBSTANCE		TAKE OF THE SUBSTANCE BELOW STATED AMOUNT IN GRAINS WITH ENOUGH WATER TO MAKE 1 PINT.	
PER CENT.	OR		
$\frac{1}{100}$ per cent..........	1 in 10,000	Grains 0.73	(¾)
$\frac{1}{50}$ "	1 in 5,000	" 1.46	(1½)
$\frac{1}{40}$ "	1 in 4,000	" 1.83	(1¾)
$\frac{1}{30}$ "	1 in 3,000	" 2.44	(2½)
$\frac{1}{25}$ "	1 in 2,500	" 2.92	(3)
$\frac{1}{20}$ "	1 in 2,000	" 3.65	(3¾)
$\frac{1}{15}$ "	1 in 1,500	" 4.87	(4¾)
$\frac{1}{10}$ "	1 in 1,000	" 7.30	(7¼)

[1] Arranged by the Public Charities and the Department of Bellevue and Allied Hospitals.

REQUIRED TO CONTAIN OF A CERTAIN SUBSTANCE					TAKE OF THE SUBSTANCE BELOW STATED AMOUNT IN GRAINS WITH ENOUGH WATER TO MAKE 1 PINT.		
PER CENT.		OR					
⅕	per cent	1	in	500	Grains	14.60	(14½)
¼	"	1	in	400	"	18.25	(18¼)
⅓	"	1	in	300	"	24.33	(24¼)
½	"	1	in	200	"	36.50	(36½)
1	"	1	in	100	"	73.00	(73)
1½	"	1	in	75	"	97.33	(97)
2	"	1	in	50	"	146.00	(146)
2½	"	1	in	40	"	182.50	(180)
3	"	1	in	33⅓	"	219.22	(220)
4	"	1	in	25	"	292.00	(290)
5	"	1	in	20	"	365.00	(365)
10	"	1	in	10	"	730.00	(730)
20	"	1	in	5	"	1460.00	(1460)
25	"	1	in	4	"	1825.00	(1825)
50	"	1	in	2	"	3650.00	(3650)

2. *To Prepare One Fluid Ounce of a Solution*

REQUIRED TO CONTAIN OF A SUBSTANCE	TAKE OF THE SUBSTANCE			
			APPROX.	
0.1 per cent............	0.46	grain	(½ gr.)	
0.5 "	2.28	"	(2¼ ")	
1 "	4.56	"	(4½ ")	
2 "	9.13	"	(9 ")	And
3 "	13.69	"	(13½ ")	enough
4 "	18.26	"	(18¼ ")	water
5 "	22.82	"	(23 ")	to
6 "	27.38	"	(27½ ")	make
7 "	31.95	"	(32 ")	1 fluid ounce.
8 "	36.51	"	(36½ ")	
9 "	41.08	"	(41 ")	
10 "	45.64	"	(45½ ")	

THERMOMETRY

The thermometers used by the nurse in cookery, in regulating the heat of the room or in taking the patient's temperatures are chiefly of the Fahrenheit scale. Scientists employ the Centigrade scale in most countries. While thermometers are made with both scales, it is a simple matter to translate the ordinary Fahrenheit to Centigrade.

The freezing point of the latter is 0°, while that of the former is 32° above 0.

The boiling point of the latter is 100°, while that of the former is 212°.

Hence, to change Fahrenheit to Centigrade, we subtract 32° from 212° in order that the freezing points correspond, which leaves 180° F. = 100° C. A degree Centigrade is therefore 5/9 of a degree Fahrenheit.

To change Centigrade to Fahrenheit, every Fahrenheit degree is 9/5 times as large as a Centigrade degree. It is also necessary to add 32° to the result.

Examples: Change 212° Fahrenheit to Centigrade.
$212° - 32° = 180° \times 5\text{-}9 = 100°$ C.
Change 100° Centrigrade to Fahrenheit.
$100° \times 9\text{-}5 = 180° + 32° = 212°$ F.

NOTE from page 11.

* Not all proteins are equally advantageous. Studies of farm animals show, for instance, that corn protein alone does not produce the best growth, but needs to be supplemented by other proteins. Investigations with pure isolated proteins of various kinds prove that some of them (as casein and edestin) will serve as the sole source of nitrogen, both for the young animal and the adult; others, as gliadin of wheat, will maintain the mother but not the growing organism; while still others, as zein of corn or gelatin, will support neither the adult nor the young. This is explained by the difference in the constitution of the proteins. They are all made up of simpler chemical compounds called amino acids, some fifteen to twenty being present in a single protein. Of these, two are demonstrated to be especially important to the body, namely, tryptophane and lysine. Without them there can be no growth in the young nor repair in the adult. Proteins which contain all the essential amino acids are called "complete"; those which have enough for all building purposes in the adult, but not in the young, are "partially incomplete"; and those which have to be supplemented by other proteins (or experimentally by the lacking amino acids) are "incomplete." One advantage in the use of milk and eggs in the diet is the assurance of having a supply of complete proteins. As already stated, gelatin will serve about two-thirds of the adult need of protein.

PART II

BEVERAGES
ANIMAL FOODS
VEGETABLE FOODS
NUTRITIOUS DESSERTS

CHAPTER VIII

BEVERAGES

ACID — ALBUMINOUS — STARCHY — MISCELLANEOUS BÈVERAGES, INCLUDING TEA, COFFEE, CHOCOLATE, AND COCOA, AND SPECIAL NON-NUTRITIVE BEVERAGES

Beverages serve primarily to relieve thirst. The universal beverage is water.[1] Other beverages answer the same purpose, because their chief constituent is water. They are also taken for their temperature — cold or hot; for their flavor, which helps to arouse or appease the appetite; or for their stimulating properties. Usually they have little or no energy value, but when made with milk, eggs, cocoa, chocolate or other highly nutritive materials, they become a valuable means of administering food in a liquid form.

All beverages need to be made with much care and served daintily. Hot drinks should be served at a temperature of 122–140° F. When water is used it should be freshly drawn, brought to a boil and used at once. This serves to sterilize it and also to develop a better flavor.

Cold drinks should be given thoroughly cooled, but iced liquids lower the temperature of the stomach unless sipped very slowly, and thus tend to retard digestion. They are therefore better for serving between meals than with them. Do not use ice in a beverage unless it is made from *pure* water, but cool by placing the receptacle on ice. Use a separate spoon, and taste every beverage just before serving to be sure it is properly seasoned and of correct temperature.

Never allow a drink to stand any length of time in a sick room. If it has to be carried any distance, be sure that it is covered.

[1] See Water, page 23.

ACID BEVERAGES

Beverages made from fruit juices are cooling and refreshing, and hence especially grateful to fever patients. They are valuable for the organic acids, mineral matter, and sugar which they contain. Some of them, as lemonade and orangeade, have an added value in their diuretic and diaphoretic action. The organic acids are useful in constipation, as they stimulate peristaltic action. These acids vary with the kind of fruit; thus, apples contain *malic* acid; lemons, *citric* acid; grapes, *tartaric* acid, etc. These acids, as elsewhere stated,[1] occur in the form of acid salts, usually of potassium, and in the body are changed to carbonates, which preserve the alkalinity of the blood. Ripe pineapple juice contains a ferment capable of digesting proteins.

Wash lemons and oranges, and in using the juice remove the seeds, as they give a bitter taste. When the rind of lemon or orange is undesirable medicinally, it should not be used.

Serve acid beverages daintily in glasses or sherbet cups (three-fourths filled), pass on small tray or plate, covered with doily, and add a few wafer crackers, or a single flower.

Sweetening Acid Drinks. For the diabetic, sugar must be replaced by Sweetina.

Whenever cold water is to be used instead of very hot or boiling water in preparing the drinks, it is preferable to use "sugar syrup" for sweetening in place of sugar, which requires time for solution.

As the acidity of fruit varies considerably with the kind, and with the season of year, this fact must be borne in mind while preparing the foregoing recipes, otherwise too much sugar may be added.

SUGAR SYRUP, 420 CALORIES

½ cup of sugar. ½ cup of boiling water.

Mix the sugar and water and stir until the sugar is dis-

[1] See Mineral Matter, p. 31.

solved. Boil slowly, without stirring, for fifteen minutes; cool slightly and bottle.

LEMONADE, 137 CALORIES

1 lemon.
¾ cup boiling water.
2 tablespoons sugar.
½ thin slice lemon.

Wash and wipe lemon; cut a very thin slice from middle. Squeeze juice into a bowl (keeping back the seeds), add the sugar and boiling water; cover, and put on ice to cool. Strain and pour into a glass or sherbet cup.

Cut half the slice of lemon into two pieces, and use as garnish in glass; or a few berries or slice of orange may be used.

Note.— The quantity of sugar used depends upon the acidity of fruit. For fruit lemonade add fresh fruit of all kinds to strong lemonade, using boiling water for the beverage, cool, and chill on ice.

LACTOSE LEMONADE,[1] 480 CALORIES

4 ounces of milk sugar (about 8 tablespoons)
7 ounces of cold water (14 tablespoons)
2 tablespoons of lemon juice (or to taste)

Boil the sugar and water for two minutes, add lemon juice to taste, strain, and cool. If not sweet enough add 1 or 2 tablespoons cane sugar.

SODA OR WHITE ROCK WATER LEMONADE, 137 CALORIES

Juice of 1 lemon.
1 or 2 tablespoons sugar.
¾ cup cold water.
¼ teaspoon soda, free from lumps.

Prepare the lemonade to taste, cool add the soda, stir thoroughly, and drink while effervescing.

Note.— Put glass on plate when soda is added. Water and soda may be omitted and White Rock Water substituted.

PINEAPPLE LEMONADE, 186 CALORIES

½ cup grated pineapple or juice.
Juice 1 lemon.
2 tablespoons sugar.
½ cup boiling water.
1 cup ice-cold water.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

Mix pineapple, lemon juice and sugar, and add the boiling water. Cool, add ice-cold water, strain and serve.

Note.— Canned pineapple may be used or pineapple juice.

IRISH MOSS LEMONADE, 25 CALORIES [1]

¼ cup Irish moss.
2 cups cold water.
4 tablespoons lemon juice.
Sugar.

Soak, pick over and wash the moss (soaking 15 minutes). Drain and add the cold water; cook in top of double boiler about 20 minutes or until syrupy. If it becomes too thick, add hot water. Strain, add the lemon juice and sugar to taste. Reheat and serve hot.

Excellent for sore throat and cold on the lungs, or any inflammation of the mucous membrane.

GRAPE LEMONADE, 200 CALORIES

Make one cup lemonade, rather sweet, add one-fourth cup grape juice.

EGG LEMONADE

See "Albuminous Beverages" for recipe. Page 121.

ORANGEADE, 197 CALORIES

1 sour orange.
½ cup boiling water.
2 tablespoons sugar.
½ slice orange.

Prepare as for lemonade. If orange is not very acid, add a little lemon juice or use less sugar.

ORANGEADE NO. II, 77 CALORIES

Put two tablespoons of crushed ice in dainty glasses and pour the juice of one orange over it. Sweeten if desired.

FRUITADE, 45 CALORIES

¼ cup grated pineapple
Juice ½ lemon.
Juice ½ orange.
1 cup boiling water.
Sugar.

Prepare fruit. Add the boiling water and one tablespoon sugar; allow to stand until cool. Add more water or sugar if necessary. Strain and serve *cold.*

[1] Without sugar.

PINEAPPLE JUICE, ABOUT 50 CALORIES

½ cup Pineapple Juice. Crushed Ice.

Pour the pineapple juice over crushed ice and serve in dainty glasses. This is delicious and has remedial qualities; especially valuable in throat and stomach trouble.

LEMON WHEY, 96 CALORIES

1 cup hot milk.
2 teaspoons sugar.
2 tablespoons lemon juice.

Heat the milk in a small saucepan over hot water, or in a double-boiler. Add the lemon juice. Cook without stirring until the whey separates. Strain through cheese-cloth, and add the sugar. Serve hot or cold. Garnish with small pieces of slice of lemon.

WINE WHEY, 84 CALORIES

1 cup sweet milk. ¼ cup sherry wine.

Heat the milk to boiling point, add the wine, and cook without stirring until the milk separates. Strain through a fine strainer, and serve hot or cold.

ACID PHOSPHATE

Horsford's Acid Phosphate is a solution of the phosphates of lime, magnesia, potash and iron with phosphoric acid, in such form as to be readily assimilated by the system. It is thus a true nerve and tissue food.

1 teaspoon Horsford's Acid Phosphate.
1 cup hot or cold water.
Sugar.

Mix the Acid Phosphate with the water and sweeten with sugar, if desired.

If the above should seem too strong, or be found too stimulating, use one-half teaspoon of the Acid Phosphate.

Note.— Horsford's Acid Phosphate can be substituted for lemon juice in any of the acid drinks.

ACID PHOSPHATE WHEY, 56 CALORIES

1 cup hot milk.
2 teaspoons sugar.
1 teaspoon Horsford's Acid Phosphate.

Heat the milk in a small saucepan over hot water or in a double boiler. Add the Acid Phosphate. Cook without stirring until the whey separates. Strain through cheesecloth and add the sugar. If more acid is desired, add two or three drops of Horsford's Acid Phosphate. Serve hot or cold.

CREAM OF TARTAR DRINK

1 or 1½ teaspoons Cream. of Tartar.
1 pint boiling water.
Lemon.
Sugar.

Dissolve the cream of tartar in the boiling water, and flavor with lemon and sugar. When cold strain. Take as a refrigerant drink and diuretic.

MALTED MILK AND CURRANT JELLY, 85 CALORIES

1 tablespoon Horlick's Malted Milk.
¼ cup boiling water.
1 tablespoon currant jelly.
¾ cup cold water.
Cracked ice.

Mix the malted milk powder with a little of the boiling water to make a smooth paste, add the jelly and the rest of the water, and stir till the jelly is dissolved. Add the cold water and ice, strain and serve daintily in glass or sherbet cup, partly filled, and set on a small plate with doily.

MALTED MILK WITH WINE, 88 CALORIES

1 tablespoon Horlick's Malted Milk.
1 cup hot water.
1 teaspoon port or sherry wine.
1 teaspoon sugar.

Mix the malted milk powder with enough of the hot water to make a smooth paste, then add gradually the rest of the hot water, the wine, and sugar if desired.

JELLY AND ICE

With a large needle or pin, chip half a cup of ice into bits as large as a pea (or use an ice-scraper). Mix with it about the same quantity of lemon, currant, blackberry, or barberry jelly. Very refreshing in fevers. Be sure ice is perfectly pure.

GRAPE WATER, 135 CALORIES[1]

4 tablespoons grape jelly.	½ cup cold water.
½ cup boiling water.	Lemon juice and sugar.

Dissolve the jelly in the boiling water, then add the cold water, season to taste. Serve *ice cold.*

CURRANT WATER, 100–125 CALORIES[1]

¼ cup currant juice or	½ cup cold water.
4 tablespoons currant jelly.	Lemon juice and sugar.
½ cup boiling water.	

Dissolve the jelly in the boiling water (put over heat a few moments if it does not dissolve quickly). When dissolved add the cold water, sweeten to taste, and add a little lemon juice, if desired. Serve cold.

APPLE, WATER, 25 CALORIES[1]

1 sour apple.	Lemon juice.
1 cup boiling water.	Sugar.

Wipe a rosy-cheeked sour apple, and, without paring it, cut it into small pieces. Add the boiling water and one tablespoon sugar. Cover, and let it stand till cold, then strain, and add lemon juice and sugar to taste. Serve cold.

Note.— Dried apple may be substituted, or two baked apples.

RHUBARB WATER, 15 CALORIES[1]

1 stalk rhubarb.	Lemon juice.
1 cup boiling water.	Sugar.

Wash and wipe the rhubarb, and cut in thin slices, leaving on the skin. Add the boiling water and one tablespoon sugar. Cover, and let stand till cold. Strain, add lemon juice and sugar to taste, and serve cold.

TAMARIND WATER, 60 CALORIES[2]

2 tablespoons preserved tamarinds.	1 cup boiling water.
	Sugar.

Pour the water over the tamarinds and let stand one-half hour. Sweeten to taste, strain and serve cold.

[1] Without lemon juice or sugar.
[2] Without sugar. Estimated from average composition of preserves.

TAMARIND MALTED MILK, 115 CALORIES

2 tablespoons Horlick's Malted Milk.
1 tablespoon tamarinds.
¼ cup hot water.
½ cup cold water.
Cracked ice.

Make a smooth paste of the malted milk powder and hot water, add preserved tamarinds and the cold water. Strain and chill, or add pure cracked ice.

GRAPE JUICE

(½ cup = 120 Calories.)

Partially fill a small glass with crushed ice, and add grape juice and serve.

Grape juice is a tonic food and a medicine for the sick and convalescent. It may be served plain, cold or hot, or diluted with one-third water. It is preferable to keep and serve the juice very cold. The bottles may be kept on ice until ready to serve.

GRAPE LITHIA, 75 CALORIES

Pour one ounce of grape juice into a glass, dissolve in it two teaspoons of sugar, and add four ounces of lithia water.

GRAPE NECTAR, 2750 CALORIES

(About 2 quarts)

Boil together one pound of sugar and one-half pint of water until it spins a thread; remove from the fire, and when cool, add the juice of six lemons and one quart of grape juice. Let stand over night. Serve with ice water, White Rock water or plain soda.

TEA PUNCH

Few beverages find readier favor during the hot weather than tea punch. To make it, pour boiling lemonade, sweetened to taste, over the tea leaves, and allow the liquid to stand until cold. Then strain and serve in tall glasses, with shaved ice and slices of lemon.

FRUIT PUNCH, 2100 CALORIES

(3 Quarts.)

2 large teaspoons tea.	3 oranges.
2 quarts boiling water.	1 pineapple.
1 pound lump sugar.	5 bananas.
8 lemons.	1 pint strawberries.

Steep the tea in the boiling water for five minutes, strain and add the sugar, stirring until thoroughly dissolved. Grate the rind of the lemons and extract all the juice. Cut the oranges into slices, shred the pineapple, slice the bananas very thin and hull the strawberries. When the tea is cold add all the fruit, and let stand in the refrigerator for several hours. Place a cube of ice in the punch-bowl, pour the mixture around it, and when well chilled serve in punch glasses. If desired, one cup of Maraschino cherries may be added.

To get the best results from the pineapple, pare and remove the eyes, tear apart with a silver knife and fork, reject the core, sprinkle with sugar and let stand on ice for twelve hours.

While fresh fruits are always preferable, canned berries and pineapples may be substituted.

TUTTI-FRUTTI PUNCH, 2300 CALORIES

(3 Quarts.)

2 quarts water.	2 tangerine oranges.
1 pound sugar.	4 slices pineapple.
2 lemons.	1 banana.
4 oranges.	1 pint Maraschino cherries.
2 dozen Malaga grapes.	

Boil together for five minutes the water and sugar. Add the grated rind of two lemons and four oranges, and continue boiling for ten minutes longer. Strain the syrup through cheese-cloth, and add one quart of cold water. Extract the juice from the lemons and oranges, strain and mix with two dozen Malaga grapes, cut in half and seeded, the tangerine oranges sliced, the pineapple shredded, the banana cut in slices, and one pint bottle of Maraschino cherries with their

liquor. Add the fruit to the syrup, chill and serve same as Fruit Punch.

ALBUMINOUS BEVERAGES

When a large amount of nutriment is required the albuminized drinks are valuable.

The egg is a fluid food until its albumin is coagulated by heat. Often the white of egg, dissolved in water or milk, and flavored, is given when the yolk cannot be digested, as 30 per cent. of the yolk is fat. Egg-nog is very nutritious, and is extensively prescribed in certain non-febrile diseases, especially for the forced alimentation of phthisis and melancholia. There are occasional cases of bilious habit, in which eggs to be digested must be beaten in wine. But the combination of egg, milk and sugar with alcohol, which constitutes egg-nog, is apt to produce nausea and vomiting in a feeble stomach, especially in fever. For this reason whole eggs are unfit for fever patients, and the whites only should be used.

Albuminized drinks are most easily prepared cold. When a hot liquid is used, it must be poured very slowly into the well-beaten egg, stirring constantly, so that lumps of coagulated albumin do not form.

For the Diabetic. In all the albuminous drinks substitute Sweetina for the sugar. The fuel value will be 60 calories less in every recipe than when one tablespoon of sugar is used.

ENERGY VALUE OF AN EGG[1]

	Calories	Calories	Calories
1 egg (without shell)	small 60	medium 73	large 80[2]
1 white of egg.......	13	18	30
1 yolk of egg.........	48	55	50

EGG BROTH, 319 CALORIES[3]

Yolk 1 egg.
1 cup hot milk.
1 tablespoon sugar.
Brandy or some other stimulant if required.
Speck salt.

Beat egg, add sugar and salt. Pour on carefully the hot milk. Flavor as desired, if with brandy or wine, use about one tablespoon.

1 Range from 60 to 100 calories according to size of egg.
2 According to Dr. W. Coleman.
3 Calculated with 1 tbsp. brandy. 277 Calories if brandy is omitted.

Note.— Dried and rolled bread crumbs may be added, if desired. The whole egg may be used. Hot water, broth or coffee, may be substituted for the milk; nutmeg may be substituted for the stimulant.

EGG-NOG NO. I, 231 CALORIES[1]

1 egg.	3/4 cup milk.
Speck salt.	1 1/2 tablespoon wine or
3/4 tablespoon sugar.	1 tablespoon brandy (or less).

Beat the egg, add the sugar and salt; blend thoroughly, add the milk and liquor. Serve immediately.

Note.— Have eggs and milk chilled before blending. A grating of nutmeg may be substituted for the stimulant. A lemonade shaker may be used for the blending.

EGG-NOG NO. II, 231 CALORIES[1]

1 egg.	3/4 cup milk.
3/4 tablespoon sugar.	1 tablespoon brandy (or less).
Speck salt.	

Separate egg. Beat yolk, add sugar and salt, and beat until creamy. Add the milk and brandy. Beat the white till foamy (not stiff and dry), and fold it in lightly. Serve immediately.

JUNKET EGG-NOG, 289 CALORIES[1]

1 egg.	2 teaspoons rum, brandy, or wine.
1 cup milk.	1/2 Hansen's Junket Tablet.
1 tablespoon sugar.	

Beat white and yolk of egg separately, very light; blend the two. Add the sugar dissolved in the rum. Heat the milk lukewarm, stir into the egg mixture, and add quickly the tablet dissolved in cold water. Pour into small warm glasses, and sprinkle grated nutmeg over the top. Stand in warm room undisturbed until firm, and then put on ice to cool. This can be retained by the most delicate stomach.

[1] Without liquor.

BEEF EGG-NOG, 200 CALORIES

1 egg.
Speck salt.
1 tablespoon sugar.
½ cup hot beef broth.
1 tablespoon brandy.

Beat the egg slightly, add the salt and sugar; add gradually the hot broth; add brandy and strain. Sugar and brandy may be omitted if preferred.

COFFEE EGG-NOG, 175 CALORIES [1]

1 egg.
1½ teaspoon sugar.
½ scant cup milk or cream.
½ scant cup strong coffee.

Chill ingredients, and blend as for Egg-nog No. II.

PINEAPPLE EGG-NOG

Prepare as per Egg-nog No. I or II; omit the brandy and use pineapple juice to taste.

EGG AND RUM, 315 CALORIES

Famous in the Treatment of Phthisis

1 cup fresh milk.
Yolk 1 egg.
1 tablespoon sugar.
Speck salt.
Few grains nutmeg.
1 tablespoon rum.

Beat yolk, add sugar, salt and nutmeg; add milk and rum.

Note.— For consumptives, taken at about 6 A. M., often prevents the exhausting sweats which accompany the morning doze. Also may be given to a patient before dressing to prevent exhaustion.

EGG AND BRANDY, 350 CALORIES [2]

3 eggs.
4 tablespoons cold water.
Nutmeg.
4 tablespoons brandy.
Sugar.

Beat the eggs, add cold water, brandy and sweeten to taste. A little nutmeg may be added. Give a tablespoonful at a time.

EGG AND WINE, 125 CALORIES [2]

1 egg.
½ cup cold water.
Sugar.
1 wineglass sherry.
Nutmeg.

[1] Calculated with milk.
[2] Without sugar.

Beat the egg. Heat the water and wine together but not boiling; pour onto the egg, stirring constantly; flavor with sugar and nutmeg.

EGG LEMONADE, 192 CALORIES

1 egg.
2 tablespoons sugar.
2 tablespoons lemon juice.
1 cup cold water.

Beat the egg thoroughly, add the sugar and lemon juice; pour in gradually the water, stirring until smooth and well mixed. Strain and serve. Two tablespoons of sherry or port may be added if desired.

MALTED MILK AND EGG, 120 CALORIES

1 tablespoon Horlick's Malted Milk.
1 tablespoon crushed fruit.
1 egg.
20 drops acid phosphate.
1 tablespoon crushed ice.
¾ cup ice water.

Mix the malted milk powder, crushed fruit and egg and beat five minutes. Add the phosphate and crushed ice, blending thoroughly. Strain and add ice water or cold carbonated water, and a grating of nutmeg to flavor.

STOKES MIXTURE

Eggs and Brandy = 196 Calories.

"2 egg yolks, 50 c. c. of brandy, 120 c. c. of aqua aurantii florun (sugar or syrup enough to sweeten), has considerable nutritive, as well as stimulative, value, and is eligible for use when such a combination is indicated."

GRAPE YOLK, 150 CALORIES

1 egg.
1 tablespoon sugar.
Speck salt.
2 tablespoons grape juice.

Separate egg. Beat yolk, add sugar and stand aside while the white is thoroughly whipped. Add the grape juice to the yolk and pour this onto the whipped white, blending carefully. Serve cold. Have all ingredients chilled before blending.

GRAPE JUICE AND EGG, 270 CALORIES

1 egg.
½ cup rich milk.
1 tablespoon sugar.
¼ cup grape juice.

Beat yolk and white separately very light. To the yolk add milk, sugar and grape juice, and pour into glass. To the white add a little powdered sugar and a taste of grape juice. Serve on yolk mixture. Chill all ingredients before using.

MULLED WINE, 250–280 CALORIES

1 ounce stick cinnamon.
A slight grating nutmeg.
½ cup boiling water.
1 egg.
½ cup sherry, port, or claret wine.
2 tablespoons sugar.

Put the spices into top of a double boiler with the water. Cover and cook over hot water ten minutes. Add wine to the spiced water and bring to the boiling point. Beat the egg to a stiff froth, add sugar and pour on the mulled wine, and beat well. Serve at once.

ALBUMINIZED MILK, 98 CALORIES

½ cup milk (sterile).
White 1 egg.
Salt.

Put milk and white of egg in a glass fruit jar, cover with air tight cap and rubber band. Shake until thoroughly blended. Strain into glass. A few grains of salt may be added if desired. Two teaspoons of Sanatogen added = 30 calories.

Note.— The blending may be done in a lemonade shaker.

ALBUMINIZED WATER, 13 CALORIES [1]

½ cup ice-cold water (boiled and chilled).
White 1 egg.
Lemon juice.
Sugar.

Blend as for "Albuminized Milk," serve plain or add lemon juice and sugar to taste. If set on ice to keep cool, shake before serving. Two teaspoons of Sanatogen added = 30 calories.

ALBUMIN WATER (FOR INFANTS), 13 CALORIES

Albumin water is utilized chiefly in cases of acute stomach and intestinal disorders in which some nutritious and easily

[1] Without lemon juice or sugar.

assimilated food is needed; albumin water is then very useful. The white of one egg is dissolved in eight ounces or a pint of water which has been boiled and cooled.— Koplik.

ALBUMINIZED CLAM WATER, 18 CALORIES

1 cup cold water.	White 1 egg.
Clam Broth.	

To the water add the required amount of the clam broth to make the strength desired, add the unbeaten white of egg, and follow general directions for "Albuminized Milk." Serve cold in dainty glasses. This is a very nutritious drink, and will be retained by the stomach when other nourishment is rejected.

Note.— Milk may be substituted for the water.

ALBUMINIZED ORANGE, 30 CALORIES[1]

White 1 egg.	Sugar.
Juice 1 orange.	

To the unbeaten white add the orange juice, sweeten to taste and blend thoroughly. Strain and set on ice to cool. Serve cold.

ALBUMINIZED SHERRY, 22 CALORIES[1]

White 1 egg.	Sugar.
¾ tablespoon sherry.	

Beat the white stiff, add slowly, while beating, the wine and sugar. Serve cold.

Note.— Have all ingredients cold before blending.

ALBUMINIZED GRAPE JUICE, 40 CALORIES[1]

2 tablespoons grape juice.	Sugar.
White 1 egg.	Chopped ice.

Put in a dainty glass the grape juice, and the beaten white of egg and a little pure chopped ice; sprinkle sugar over the top and serve.

[1] Without sugar.

STARCHY BEVERAGES

Starchy drinks consist of cereals or cereal products, cooked thoroughly in a large amount of water and strained before serving. Arrowroot, cornstarch, tapioca, rice and rice flour are nearly pure starch. Oats, barley and wheat in forms which include the whole grains contain besides starch some protein and fat, and also valuable mineral matter, especially phosphorus, iron, and calcium salts.[1] In starchy drinks, these ingredients are necessarily present in small amounts; hence they have little energy value, unless milk or other highly nutritive material is added. Such drinks are of value when only a small quantity of nutriment can be taken.

Principles of Cooking. As the chief ingredient is starch, long cooking is necessary, in water at a high temperature (212° F.), which softens the cellulose, and breaks open the starch grains, changing the insoluble starch to soluble starch and dextrin, so that it can be very readily digested. Time of cooking should be conscientiously kept by the clock.

Digestion. The action of ptyalin is very rapid, and if these drinks are sipped slowly, so as to be thoroughly mixed with saliva, a considerable portion of starch may be changed to sugar before reaching the intestines.

BARLEY WATER, 180 CALORIES

2 tablespoons pearl barley. 1 quart cold water.

Wash barley, add cold water and let soak several hours or over night; in same water, boil gently over direct heat two hours, or in a double boiler steadily four hours, down to one pint if used for infant feeding, and to one cup for the adult. Strain through muslin.

Note.— Cream or milk and salt may be added, or lemon juice and sugar. Barley water is an astringent or demulcent drink used to reduce laxative condition.

[1] See Mineral Matter, p. 31.

BARLEY WATER (INFANT FEEDING), 19 CALORIES

1 teaspoon barley flour.
2 tablespoons cold water.
1 pint boiling water.

Blend flour and cold water to a smooth paste in top of double boiler; add gradually the boiling water. Boil over direct heat five minutes, stirring constantly, then put over boiling water and cook 15 minutes longer, stirring frequently. Older infants take the barley water in much more concentrated form. Barley water is used as a diluent with normal infants and in forms of diarrhœa.

Note.— For children or adults, use ½ tablespoon barley or rice flour, 1 cup boiling water, ¼ teaspoon salt.

RICE WATER, 100 CALORIES[1]

2 tablespoons rice.
3 cups cold water.
Salt.
Milk.

Wash the rice; add cold water and soak thirty minutes, heat gradually to boiling point and cook one hour or until rice is tender. Strain, reheat and dilute with boiling water or hot milk to desired consistency. Season with salt.

Note.— Sugar may be added if desired, and cinnamon, if allowed, may be cooked with it, and will assist in reducing a laxative condition.

RICE WATER NO. II, 160 CALORIES

3 tablespoons rice.
1 pint boiling water.
1 tablespoon stoned raisins.

Wash rice, put into saucepan with water and raisins; boil gently for one hour. Strain. When cold serve. Sugar or salt may be added to taste.

Note.— Do not use raisins in bowel trouble.

OATMEAL WATER, 50 CALORIES

1 tablespoon oatmeal.
1 tablespoon cold water.
Speck salt.
1 quart boiling water.

Mix oatmeal and cold water, add salt and stir into the boiling water. Boil three hours; replenish the water as it

[1] Without milk.

boils away. Strain through a fine sieve or cheese cloth. Season, serve cold. Different brands of oatmeal vary considerably in the amount of water which they take up in cooking, and sufficient should always be added to make this drink almost as thin as water.

OATMEAL WATER NO. II, 220 CALORIES [1]

½ cup fine oatmeal. 1 quart water.

Use sterile water (boiled and cooled). Add oatmeal and stand in warm place (covered), for one and one-half hours. Strain, season, and cool. Sometimes used for dyspeptics.

TOAST WATER, 350 CALORIES

1 cup stale bread toasted. Salt.
1 cup boiling water.

Cut bread in thin slices and in inch squares. Dry thoroughly in oven until crisp and a delicate brown. Measure, and break into crumbs; add the water and let it stand one hour. Rub through a fine strainer, season and serve hot or cold. The nourishment of the bread is easily absorbed in this way and valuable in cases of fever or extreme nausea.

Note.— Milk or cream and sugar may be added.

CRUST COFFEE

Take some pieces and crusts of brown bread and dry them in a slow oven until thoroughly hard and crisp. Place in a mortar and pound or roll. Pour boiling water over and let soak for about fifteen minutes. This when strained carefully is very acceptable to invalids who are tired of the ordinary drinks, such as lemonade, etc.

CRACKER PANADA, 100 CALORIES [2]

4 hard crackers. Sugar.
1 quart water.

Break crackers into pieces and bake quite brown; add water and boil fifteen minutes, allow to stand three or four minutes. Strain off the liquid through a fine wire sieve; season with salt

[1] Estimated on one-half the oatmeal.
[2] Without sugar.

and a little sugar. This is a nourishing beverage for infants that are teething, and with the addition of a little wine and nutmeg, is often prescribed for invalids recovering from a fever.

BREAD PANADA, 162 CALORIES

1½ cups water.	¼ cup white wine.
1 tablespoon sugar.	1 tablespoon lemon juice.
2 tablespoons stale white bread crumbs.	Nutmeg.

Put water and sugar on to cook, just before it commences to boil add the bread crumbs; stir well, and let it boil three or four minutes. Add the wine, lemon and a grating of nutmeg; let it boil up once, remove from fire, and keep it closely covered until it is wanted for use.

MISCELLANEOUS BEVERAGES

TEA — COFFEE — CHOCOLATE — COCOA AND SPECIAL NON-NUTRITIVE BEVERAGES

TEA

Source. The tea of commerce is prepared from the leaves of a shrub cultivated for this purpose in China, Japan, India, Ceylon, and other portions of Southern and Eastern Asia.

Classes of Tea. There are two great classes of tea, the green and the black. The difference lies in the mode of preparation. Green teas are quickly dried and fired; black teas are allowed to ferment a few hours before drying and firing.

Active Principles of Tea. Tea has practically no food value. Its principal constituents are caffein, tannic acid, and a volatile oil.

Its flavor is due to the volatile oil; its stimulating properties to the caffein. Tannic acid is a soluble, bitter substance, which has a retarding effect on digestion.

When tea leaves are placed in boiling water, caffein is extracted very rapidly. Tannic acid is less soluble, and therefore it is possible to make tea with little of this principle by letting the water stand on the leaves only a short time. In

practice, the hot, but not boiling water, should stand on the tea from 3 to 5 minutes. The water should be soft, as lime in hard water tends to make tannin dissolve more freely. Green or mixed tea is more powerful than black tea.

Effects of Tea. Tea is mildly stimulating and hence refreshing, as it removes the sense of bodily fatigue. But the tannic acid retards the digestive action of the saliva and gastric juice, and tends to produce constipation. Tea is therefore not suitable for persons suffering from gastric disorders. The caffein is over-stimulating to the nervous system of many persons, causing restlessness, sleeplessness and muscular tremors. It should not be given to children, nor to adults with a tendency to nervousness. If you wish to avoid the retarding effect of tea on salivary digestion, direct the patient not to sip the beverage with the meal, but to eat first and drink afterward; in this way time is given for the saliva to perform its intended functions.

Tea is less likely to cause sleeplessness if lemon juice is substituted for milk.

COFFEE

Source. This beverage is prepared from the seeds of the coffee tree (Caffea arabica), which grows in many warm countries, though originally found in Arabia. The coffee berry is about the color and size of a ripe cherry, and contains two seeds placed face to face.

Active Principles of Coffee. The active principles of coffee are essentially the same as those in tea. By the roasting process a *volatile oil* is liberated (called caffeol) to which the aroma is due. The *caffein* is chemically the same as in tea, and according to Hutchison (p. 310), a cup of black coffee contains about as large a quantity of caffein and tannic acid as a cup of tea.

Effects of Coffee. Coffee has only a slight retarding influence on salivary digestion, compared with tea, but an equally detrimental effect on gastric digestion.

As a stimulant it effects more directly the central nervous

system; the heart action is considerably increased in rate as well as strength. Indirectly, this results in an increased activity of the kidneys. The respiration is deepened and the cerebral centers excited. For this reason it often proves useful in cases of opium and alcoholic poisoning. In some persons these effects are very mild; in others, they are severe, producing nervousness and insomnia, and coffee should be withheld. It removes the sensation of fatigue, for which reason it is used by many nurses when on night duty. It should never be given to children.

Coffee or tea taken with either milk or sugar alone is much more healthful and less likely to cause ill effects than when both are used.

Frequently after operation freshly made black coffee or tea without milk or sugar will be retained, and in some cases check vomiting. Give the patient one-half teaspoonful at frequent intervals.

Many preparations have been put upon the market as coffee substitutes, but they lack the aromatic oil and caffein for which it is really prized. They make, however, pleasing hot beverages, and served with sugar and cream, have a food value.

CHOCOLATE AND COCOA

Source. Cocoa and chocolate are commercially prepared from the seeds of the cocao tree, *Theobroma cocao.* The seeds (or beans) are contained in a pulpy fruit 7-12 inches long, 3-5 inches in diameter, in shape intermediate between a melon and a cucumber. The fruit is gathered and allowed to remain in a heap to ferment a few days, when the pulp becomes loosened. The seeds lose some of their bitterness during this process, upon which the flavor of the bean largely depends. They are then dried in the sun, cleaned and sorted, and carefully roasted. After this the thin outer husks are removed and sold under the name of cocoa shells. The broken roasted beans constitute cocoa nibs.

Chocolate is prepared by grinding the nibs between hot rollers to a great degree of fineness. The presence of 50 per

cent. fat causes the mass to form a paste. This is molded and cooled with or without the addition of sugar and flavoring.

Cocoa consists of chocolate deprived of a part of the fat. Sugar or starch or both, are sometimes added.

Resemblance to Tea and Coffee. Chocolate and cocoa contain a volatile oil, set free by the fermentation process and further modified by roasting, to which the characteristic flavor is due. They also contain tannic acid, but in smaller amount than in tea or coffee. The stimulating principle of chocolate and cocoa is an alkaloid closely allied to caffein, called theobromin. It is less apt to induce nervous symptoms than either tea or coffee, but in many persons their stimulating power is distinctly felt.

Nutritive Value. Unlike tea and coffee, chocolate and cocoa have a high food value, as shown by the following analysis:

	Protein	Fat	Carbo-hydrates	Mineral Matter	Water	Calories per lb.
Chocolate	12.5%	47.1%	26.8%	3.3%	10.3%	2720
Breakfast Cocoa	21.6%	28.9%	37.7%	7.2%	4.6%	2320

By reason of the high percentage of fat, chocolate is likely to cause indigestion when used to excess, or when taken in addition to an otherwise heavy meal. Cocoa, being less rich in fat, is free from this objection.

The use of cocoa often makes milk acceptable when it would otherwise be refused. Hence this beverage is good in convalescence, if there are no digestive disturbances. When made weak, it can also be given to children in moderation.

Principles of Cooking. Chocolate and cocoa both contain considerable starch, and hence should be boiled to be digestible. The cooked starch also serves to thicken the beverage somewhat, and to make it smoother and more homogeneous. On account of the volatile oil to which the flavor is due, the cooking should be continued only long enough to alter the starch, otherwise the oil is lost.

TEA

(Individual Rule.)

1 teaspoon tea.	1 cup boiling water.

Scald the teapot, which should be silver, crockery or granite ware, not tin. Put in the tea, add the freshly boiling water and let it infuse three to five minutes. By no means allow it to boil, for boiling dissipates the aroma and extracts the tannin. Strain into hot cup and serve with cream or milk and lump sugar, or with sugar and a slice of lemon.

RUSSIAN TEA

Heat cup, fill three-fourths full of boiling water and dip in it two teaspoons tea (put in tea-ball or fine small strainer), until strong enough. Serve hot with sugar and a slice of lemon.

Note.— Lemon is a good substitute for milk. The lemon prevents the headache and sleeplessness which the milk in tea causes to some persons.

COFFEE MADE IN THE PERCOLATER

Breakfast Coffee.	After-Dinner Coffee.
2 tablespoons coffee.	Increase quantity of coffee to
1 cup cold water.	suit the taste.

From the percolator take out the cup with its tube, fill the percolator with the quantity of water desired, replace cup and tube (covering tube with thumb), and put in the coffee, then put on the spreader plate and cover. Cook fifteen minutes.

Note.— If warm or hot water is used it takes less time for cooking. Never use boiling water. It takes a little longer with the urns than with the pots.

When heat is applied to the foot of the pot, a jet of water lukewarm at first, but quickly increasing in temperature as the pumping process goes on, is forced up through the tube, falls on the spreader plate; by it, it is evenly distributed over the coffee, through which it percolates down into the pot again. This pumping continues until the water reaches the boiling point, when water and steam together come up through the tube. The coffee is thus ready to serve.

Coffee made in this way has a delicious aroma, a fine flavor and an absence of the bitter taste caused by boiling. Many can drink coffee made in this way that cannot when made in other ways.

Buy coffee in the berry and grind it fresh every day, for ground coffee soon loses its aroma.

BOILED COFFEE

(To make seven cups of coffee.)

1 cup coffee.	6 cups boiling water.
½ egg and shell.	1 cup cold water.

Scald coffee pot. Wash egg, beat slightly and add crushed shell, coffee and one-half cup cold water. Put into scalded coffee pot, add boiling water and let boil up three times, stirring down after each time (or boil five minutes); then add one-half cup cold water. Let it stand 20 minutes where it will keep hot but not boil. Serve in hot coffee cups with cream and sugar, or hot milk may be used in place of cream.

Note.— A favorite blend of coffee is three parts Java and one part Mocha.

BOILED COFFEE

(Individual Rule.)

2 tablespoons coffee.	¾ cup boiling water.
1 egg shell or 1 teaspoon egg white.	¼ cup cold water.

Follow general directions for blending in preceding recipe. Boil three minutes and keep hot 15 minutes.

For the Diabetic. The following varieties may be used. Pour coffee into a slightly beaten egg or yolk; or one teaspoon butter; or heavy cream. Substitute Sweetina for sugar.

FILTERED COFFEE

(Individual Rule.)

2 tablespoons finely ground coffee.	¾ cup boiling water.

Place a piece of filter paper over a strainer and put the coffee in it. Hold the strainer over a hot coffee cup and pour the boiling water slowly over the coffee.

COFFEE WITH LACTOSE, 300 CALORIES[1]

	Calories
1½ ounces of milk sugar (about 3 tablespoons)	180
4 to 5 ounces of strong coffee (8 to 10 tablespoons)	
2 ounces of cream (4 tablespoons)	120

By previously dissolving the milk sugar in water, 72 grams of it may be put into a cup of coffee

MALTED MILK COFFEE, 59 CALORIES[2]

(Individual Rule.)

1 tablespoon Horlick's Malted Milk.
Sugar.
1 tablespoon ground coffee.
¾ cup boiling water.

Mix the malted milk powder, coffee and water, stirring well. Boil three minutes. Add sugar if desired.

Or one to four teaspoons of malted milk powder may be put in a cup and ordinary coffee poured directly upon it, stirring constantly.

COCOA WITH LACTOSE 490–470 CALORIES[1]

Cocoa with milk:	Calories
1 rounding teaspoonful of cocoa	50
2 ounces of milk sugar	240
4 ounces of milk	80
2 ounces of cream	120

Mix the sugar and cocoa; cook in the milk until dissolved. Serve with the cream.

Cocoa with water:	Calories
1 Heaping teaspoonful of cocoa	50
2 ounces of milk sugar	240
½ cup water — 3 ounces of cream	180

Mix cocoa and sugar, add the water, and boil. Then add the cream, or use less cream and serve with whipped cream.

BREAKFAST COCOA, 957 CALORIES

(To make six cups of cocoa.)

3 tablespoons Walter Baker's cocoa.
4 tablespoons sugar.
1 cup boiling water.
3 cups scalded milk.

1 Dr. W. Coleman, "American Journal of Medical Sciences," January, 1912.
2 Without sugar.

Scald milk in double boiler. Put the cocoa and sugar in a saucepan and slowly pour on the hot water, stirring all the time. Boil five minutes, add the scalded milk, beat until foamy with Dover egg beater to prevent formation of skin. Serve in heated cups. One-half cup of cream is a great addition to cocoa.

BREAKFAST COCOA, 197 CALORIES

(Individual Rule.)

2 teaspoons Walter Baker's cocoa.
1 teaspoon sugar.
¼ cup boiling water.
¾ cup scalded milk.

Follow general directions for blending and cooking in preceding recipe. Boiling three minutes.

Note.— Cocoa may be served hot or ice cold, with or without whipped cream. It may be served hot, poured over the beaten white or yolk of egg. One-third teaspoon of brandy may be added if ordered by the physician.

MALTED MILK COCOA, 83 CALORIES[1]

(Individual Rule.)

1 tablespoon Horlick's Malted Milk.
1 teaspoon cocoa.
¾ cup boiling water.
Sugar.

Mix the malted milk powder, cocoa and water, stirring well. Boil three minutes. Add sugar if desired and serve hot.

PLAIN CHOCOLATE, 1220 CALORIES

(Eight Cups.)

1 quart milk.
2 ounces Walter Baker's chocolate.
2 tablespoons boiling water.
½ tablespoon cornstarch.
3 tablespoons sugar.
Speck salt.

Mix the cornstarch with one-fourth cup of the milk. Put remainder of milk in double boiler to heat. When the milk is scalded, stir in the cornstarch and cook ten minutes. Scrape the chocolate and put it in a small saucepan; add sugar and water and place the saucepan over hot water. Stir

[1] Without sugar.

constantly until the mixture is smooth and glossy. Add the hot milk and beat the mixture with egg beater until frothy; or it may be poured back and forth from the boiler to a pitcher, holding high the vessel from which it is poured. This will give a thick froth. Serve at once.

Note.— If you prefer not to thicken the chocolate, omit the cornstarch.

Whipped cream may be served with chocolate, or it may be poured onto the beaten yolk of egg.

If desired, flavor with one-half teaspoon vanilla.

PLAIN CHOCOLATE, 305 CALORIES

(Individual Rule.)

1 cup milk.
½ ounce chocolate.
⅛ tablespoon cornstarch.
¾ tablespoon sugar.

Following directions for blending and cooking in preceding recipe.

CHOCOLATE, VIENNA STYLE, 1427 CALORIES

(Eight Cups.)

1 quart milk.
4 ounces Walter Baker's vanilla chocolate.
3 tablespoons boiling water.
1 tablespoon sugar.

Scald milk in double boiler. Scrape chocolate and put sugar and water into a small saucepan; heat over hot water, stirring till smooth and glossy. Stir this mixture into the hot milk and beat well with an egg beater. Serve at once, putting a tablespoon of whipped cream in each cup, and filling with the chocolate.

The plain chocolate may be used instead of the vanilla, but in that case use one teaspoon vanilla and three generous tablespoons sugar.

CHOCOLATE MILK SHAKE, 295 CALORIES

(Individual Rule.)

2 tablespoons chopped ice.
2 tablespoons chocolate syrup.
3 tablespoons whipped cream.
½ cup milk.
¼ cup soda water or White Rock water.

Shake or stir well before drinking. A tablespoon of vanilla ice-cream is a desirable addition. It is a delicious drink, even if the soda or White Rock water be omitted.

A plainer drink is made by combining the syrup, three-fourths cup milk and the ice, and shaking well.

CHOCOLATE SYRUP — USED IN PRECEDING, 2093 CALORIES

(One Tablespoon = 65 Calories.)

1 ounce (3 tablespoons) Walter Baker's soluble chocolate.
1 cup boiling water.
1 tablespoon vanilla.
2 cups sugar.

Put chocolate in a saucepan and add the water gradually, stirring all the time. Add sugar and stir till it begins to boil; boil three minutes, strain, cool and add one tablespoon vanilla. Bottle, and keep in a cold place.

SPECIAL NON-NUTRITIVE BEVERAGES

FLAXSEED TEA

1 tablespoon whole flaxseed.
2 cups cold water.
Lemon juice to taste.
Sugar.

Wash flaxseed thoroughly, put it with the cold water in a saucepan, simmer one hour, add lemon juice and sugar to taste and strain.

Note.— If too thick, add hot water.

Valuable in case of inflammation of the mucous membrane.

CINNAMON WATER

1 ounce stick cinnamon.
1 pint boiling water.

Boil together fifteen minutes. Strain. Serve hot or cold.

Note.— Good in bowel trouble. The pure cinnamon is quite different from the coarse bark usually sold for cinnamon, which is really only cassia.

FLAXSEED AND LICORICE TEA

1 ounce flaxseed.
2 drachms licorice root.
1 pint boiling water.

Pour the boiling water over whole flaxseed and bruised licorice-root, cover and cook very slowly for four hours. Strain.

LIME WATER

1 tablespoon of slaked lime.
1 quart boiled or distilled water.

Put the lime and water in a corked bottle and shake thoroughly two or three times during the first hour. The lime should then be allowed to settle, and after twenty-four hours the upper clear fluid carefully poured or siphoned off into a glass-stoppered bottle. Keep tightly corked, as it absorbs carbon dioxide from the air. Keep in a cool place.

BRAN TEA

¼ cup wheat bran.
2 cups cold water.
Egg shell.
Molasses, lemon juice.

Boil the water and bran twenty minutes, and settle it with an egg shell or a little cold water. Sweeten with molasses, and lemon juice can be used if desired.

SLIPPERY ELM TEA

2 teaspoons slippery elm powder or piece of the bark.
1 cup boiling water.
Sugar.
Lemon juice.

Pour the water upon the slippery-elm powder or bark. When cool, strain and flavor with lemon juice and sugar. This is soothing in case of inflammation of the mucous membrane.

HERB TEA

Pour one cup of boiling water over two tablespoons of herbs. Cover the bowl, set it over the tea-kettle and steep ten minutes. Sweeten if desired.

GINGER TEA

Mix one tablespoon of molasses with one-half teaspoon of ginger; pour on gradually one-half cup boiling water, and boil one minute. Add one-half cup milk and when thoroughly heated, serve.

CHAPTER IX

ANIMAL FOODS

The important foods derived from the animal kingdom are — Meat — Poultry and Game — Fish — Shell Fish — Eggs — Milk and Milk Products — Sweetbreads — Gelatin — Beef Preparations — Meat Broth and Jellies.

Composition. Milk is the only animal food in which all the nutrients are represented in forms and proportions suitable to supply all the needs of the body. It is properly called a "complete food." Eggs, also often called "complete food," contain both body-building and fuel food-stuffs, but are incomplete in the sense that the amount of carbohydrate is so small as to be almost negligible.

Meats are valuable primarily as sources of protein. When fat is present they are also useful for fuel.

Meat extracts are chiefly valuable for their flavor and stimulating properties.

The Proteins of animal foods are of many forms, conspicuous among which are albumin of egg-white; myosin of muscle; casein of milk; fibrin of blood; nucleo-protein of liver and sweetbreads; collagen of connective tissue.

The Fats are chiefly mixtures of stearin, palmitin and olein in varying proportions; small amounts of esters of volatile fatty acids; and compounds of fats with phosphorus in the form of lecithin and related substances.

Extractives. Nitrogenous extractives are found chiefly in meat, to which they help to give the characteristic flavor and the stimulating properties. They consist chiefly of purins (adenine, guanine, xanthine, hypoxanthine and uric acid); and creatin and creatinin.

Carbohydrates. The carbohydrates are represented mainly

by lactose in milk, and glycogen in shellfish. As a rule, carbohydrates are negligible in animal foods.

Water. Water is present in all animal foods. Some examples, showing the varying proportions in different kinds, are given in the following table:

Oyster solids	88%
Milk	87%
Eggs	73%
Lean beef	75%
Salt cod	50%

Mineral Matter. Milk and eggs are more valuable for their ash constituents than any other animal foods. Calcium, iron and phosphorus especially, are here found in most available forms.

Meats are not particularly useful in this respect. They are deficient in calcium, and while they contain considerable iron, it is not in as useful a form as that in eggs. Most of the ash constituents found in the body are, however, represented in flesh foods.

Digestibility. As a class, animal foods are easy of digestion. They contain little indigestible residue, and the nutrients are very perfectly absorbed. Prepared for the table, they are more concentrated than most vegetable foods. Hence animal foods are frequently chosen for invalids and convalescents, regardless of their high protein content.

Disadvantage of a Purely Animal Diet. The chief disadvantages of a purely animal diet are that it does not afford sufficient bulk to maintain the proper functioning of the alimentary tract, owing to the lack of indigestible residue; and that it loads the body with an excess of nitrogenous material, which is not only unnecessary for repair, but may cause harm if not speedily eliminated. Furthermore, protein raises the metabolism so that more food is actually required than if carbohydrates and fats are used as fuel. For further discussion of the relative merits of animal and vegetable diets, see page 233.

MEAT

The term meat includes the flesh of all animals used for food, as beef, veal, mutton, lamb, pork, poultry, game. Lean meat is almost a pure protein food.

Composition of Meat:

1. Muscle fibers, composed of proteins, extractives, inorganic salts, and water.

   The principal protein is albumin. Muscle albumin is often called myosin.

   The extractives are largely nitrogenous.

   The mineral constituents in greatest abundance are phosphates and potash salts.
2. Connective tissue which binds together the muscle fibers, this consisting chiefly of a protein called collagen, which yields gelatin on boiling.
3. Fat interspersed between the fibers.

Nutritive Value. Meat is rich in nitrogenous elements and fats, and contains important salts, chiefly potassium and iron. It is easily cooked and improves in flavor during the process; requires less mastication and is more easily digested and assimilated than most vegetable food.

Meat is lacking in carbohydrates, and unless a large amount of fat is present, is to be regarded as a source of nitrogen rather than of energy. Since protein burns up faster than other foods, and very little of the nitrogen can be retained in the body, it is most advantageously used in small amounts along with plenty of fats and carbohydrates.

The most important food element in meat is the myosin or muscle albumin. The collagen belongs to a group of proteins often called gelatinoids or albuminoids, because, unlike the albumins, they cannot sustain life alone. They are able, however, to replace other proteins to the extent of two-thirds of the ordinary nitrogen requirement. In young animals, the connective tissue is soft, and the tissues are easily masticated; but in older animals it becomes very firm, is hard to chew

and often escapes digestion unless softened or changed to gelatin by cooking.

The nitrogenous extractives have no nutritive value, and in fact, represent products either of waste (katabolism) or of insufficient oxidation. Unless promptly excreted, they may cause an excess of uric acid or other disorders. However, they bestow upon cooked meat its characteristic flavor and odor; in the stomach, act as stimulants to the secretion of gastric juice; and exert on the nervous system a stimulating influence similar to that of tea and coffee.

Digestibility of Meat. Meat is easily digested, the degree of ease depending upon the following conditions: (1) The age of the animal when killed, with the exception of veal, the flesh of the young animal is more easily digested, but less nutritious than that of the older one; (2) the time the animal is kept before cooking; (3) the sex; (4) the care bestowed on the animal during life; (5) the quantity of fat. Lean meat is more easily digested than fat meat.

Absorption of Meat. Meat is very readily absorbed and leaves little residue in the intestines; only 3 per cent. of meat taken is lost in the process of digestion.

Uncooked Meat. Ordinary raw meat is not quite as easily digested as cooked meat. Owing to color and flavor, it is not appetizing and could not be taken continuously. However, when chopped fine or scraped free from connective tissue, so as to be easily attacked by the digestive juices, it is more readily digested than cooked meat.

Effect of Cooking Meat. Proper cooking makes meat more digestible, as it softens the connective tissues, thus causing a separation of the muscular fibers, and enabling the digestive juices to act more advantageously. The color and flavor are improved. There is a loss of weight by evaporation of water, and loss of mineral matter and some extractives. The loss of water concentrates the nutrients, and thus renders cooked meat proportionally more nutritious than raw meat.

Objective Points and Methods in Cooking:

1. To retain the juice as in baking, broiling, boiling and frying.

2. To extract the juice as in soups.

3. To extract and retain the juice as in stews.

The Principal Constituent of meat to be considered in cooking is the albumin. Note page 11, for albumin.

Cooking of Meat. Heat penetrates meat slowly. At a temperature of 158 degrees Fahrenheit, the meat assumes a gray color, as a result of the decomposition of the coloring matter of the blood. At the same time a peculiar odor of cooking develops, which is due to chemical changes produced by the heat.

At a temperature above 104 degrees Fahrenheit, meat begins to lose weight from the separation of water, which contains salts and nitrogenous extractives. This process continues as the temperature rises, except that coagulable proteins no longer separate with the water.

Coagulation of the albumin is an important factor in cooking meat, and the degree varies with the mode of cooking.

As broiling is the preferred way of preparing meat for the sick and convalescent, it is taken up in detail in this chapter.

Broiling. In broiling, the meat is to be cooked in its own juices; it is, therefore, evident that these must be retained as completely as possible. At first the temperature should be sufficiently high quickly to coagulate, and even harden the albumin on the outside surface, so as to form a layer or protecting coat over the whole; then the heat should be modified so that the interior will be raised to a temperature that will cook it properly without loss of its nutritive properties.

In broiling we partially sacrifice the outer layer of the meat, to preserve the inner portion.

The time for exposure will be different for different kinds of meat. Beef and mutton require a shorter time than lamb, chicken or game.

A piece of meat properly broiled swells, and when cut, the

liquid portion flows out readily; but if cooked too long the albumin inside coagulates and the meat loses its moisture, shrinks, and becomes tough.

Effect of Cold and Hot Water on Meat. Cold water draws out the soluble albumin, the extractives and some of the salts; thus in soups, broths and stews where all the nutriment possible is desired in the liquid, the meat is first put into cold water and gradually brought to a higher temperature.

Hot water or dry heat coagulates albumin, and since if subjected to too high a temperature this becomes tough and indigestible, we must note carefully the proper temperature of cooking. Often it is necessary to sacrifice a small amount of albumin by exposing the meat to a high temperature for a short time to form a coating on the meat, in order to retain the rest of the juices more effectively, after which the connective tissue can be softened by gentle simmering for several hours.

The Quality of Meat depends upon the age, sex, environment, care, feeding and time of hanging after slaughtering. It also depends greatly on the cuts used.

The tougher and less expensive cuts, if properly cooked, are as nutritious and as easily digested as the expensive cuts; however, tough meats take long, slow cooking to make them palatable, and the fuel used must be taken into consideration in the expense. Tough meats are muscles which the animal uses the most, as the legs (especially the lower part), neck, etc.; they are more highly flavored on account of the freer circulation of blood through these portions. Cuts from the neck and shin are used for soups and broths.

The tenderer and more expensive cuts are from the muscles which the animal uses the least, as the upper portion of the hind quarter (rump, sirloin) and fore ribs. The circulation of blood through these portions is less and they are not as juicy and well flavored, nor any more nutritious than tougher portions. These tenderer cuts are used for steaks and roasts.

The remaining muscular portions of the animal (flank, shoulder and brisket) are not as tender as the upper portion

of the hind quarter, but just as nutritious. They need longer cooking and are used for stews, braising and pot roast.

Internal Organs or Animal Viscera used as food are the heart, tongue, brain, kidneys, liver, pancreas, thymus glands and paunch. Although some are as easily digested as most muscle tissue, they are not as nutritious, and most of them produce large quantities of uric acid.

The heart, liver and kidneys, when properly cooked, are not as easily digested as other meats, on account of their close and firm texture, and should be eaten only by those of good digestive powers.

The tongue is not very easily digested, for although the lean meat is tender, the fat is hard, and tends to retard digestion in the stomach.

The brain is the most rapidly digested of meats, but a very high per cent. is of no use to the body. It is not suited for invalid diet on account of the high fat content.

The paunch is the third stomach of the ox and called tripe. When properly cooked it is easily digested, but contains too much fat to give an invalid.

The pancreas and thymus glands of the calf or lamb are sold under the name of sweetbreads. They are most easily digested, but give rise to uric acid. Note chapter on Sweetbreads.

Beef. Beef, is without doubt, the most valuable kind of meat; it is nutritious, of excellent flavor, and comparatively easy of digestion.

Test for Good Beef. The flesh is firm and fine grained in texture; bright red in color when first cut and upon exposure to air; looks juicy and well-mottled and coated with fat, and the fat is of yellowish color and firm.

The best beef is obtained from the steer of four to six years of age. After killing, the animal should hang for two to three weeks.

Veal. The flesh of the calf is difficult of digestion and should only be used in the sick room for making broth. It should never be eaten by those of weak digestion. It con-

tains less albuminous substances, and more gelatin than beef.

Test for Good Veal. It should be of a pinkish color, with clear, firm, white fat, fine grained and tender. The cut most used for broth and soup is the lower part of the leg known as the knuckle.

Mutton. Next to beef, mutton is considered the most nutritious of meats, and by some considered as easily digested; but it is known that fat of mutton, which consists largely of stearin, is not as easily digested.

The best quality of mutton comes from a sheep from three to five years old; after killing it should be allowed to hang to ripen and to develop the flavor.

Test for Good Mutton. The flesh is fine grained, bright pink in color, the fat is white, hard and flaky, and the skin comes off easily. The bones of mutton are white and smooth and round at the joints.

Lamb. Lamb of the right age is as nutritious as beef or mutton but the flesh is milder in flavor.

Lamb is sold as "spring lamb" when killed at six weeks to three months old. It is very expensive and comes into the market early in the year — February and March. Lamb is usually killed when a year old, and should be sold immediately after killing; in this respect it differs from beef and mutton, which should hang after killing to ripen and develop the flavor.

Test for Lamb. Lamb can be distinguished from mutton by the pinkish color of the bone, and the serrated joints.

Pork. The flesh of the pig is the most indigestible of all meats on account of the large percentage of fat which it contains, consequently it is not used in cookery for the sick, except sometimes a small amount of ham, salt pork or bacon, as the salty taste occasionally acts as a stimulant to the lost appetite of the convalescent. Ham and bacon are more easily digested than other cuts of pork, and when thin strips of bacon are cooked crisp they are easily digested. Bacon is from the flank of pork and is salted and smoked. Next to

butter and cream, bacon fat is the most easily assimilated of ordinary food fats.

Cuts of Meat.[1] The methods of cutting sides of beef, veal, mutton, and pork into parts, and the terms used for the different "cuts," as these parts are commonly called, vary in different localities. The diagrams show the positions of the different cuts, both in the live animal and in the dressed carcass, as found in the markets. The lines of division between the different cuts will vary slightly, according to the usage of the local market, even where the general method of cutting is as here indicated. The names of the same cuts likewise vary in different parts of the country.

Cuts of Beef

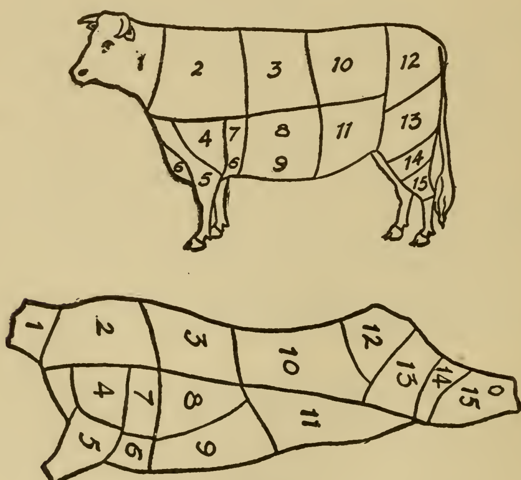


Fig. 5

Fig. 5.— Diagrams of cuts of beef: 1, Neck; 2, chuck; 3, ribs; 4, shoulder-clod; 5, fore-shank; 6, brisket; 7, cross-ribs; 8, plate; 9, navel; 10, loin; 11, flank; 12, rump; 13, round; 14, second-cut round; 15, hind-shank. — (Atwater and Bryant, Bulletin No. 28, Office of Experiment Stations, United States Department of Agriculture.) Send for Bulletin for cuts of Veal and Pork.

[1] This section is quoted from Atwater and Bryant, Bulletin No. 28, Office of Experiment Stations, United States Department of Agriculture, Washington, D. C.

The general method of cutting up a side of beef is illustrated in Fig. 5, which shows the relative position of the cuts in the animal and in a dressed side. The neck piece is frequently cut so as to include more of the chuck than is represented by the diagrams. The shoulder-clod is usually cut without bone, while the shoulder (not included in diagram) would include more or less of the shoulder blade and of the upper end of the fore-shank. Shoulder steak is cut from the chuck. In many localities the plate is made to include all the parts of the fore-quarter designated on the diagrams as brisket, cross-ribs, plate, and navel, and different portions of the plate, as thus cut, are spoken of as the "brisket end of plate" and "navel end of plate." This part of the animal is largely used for corning. The ribs are frequently divided into first, second, and third cuts, the latter lying nearest the chuck and being slightly less desirable than the former. The chuck is sometimes sub-divided in a similar manner, the third cut of the chuck being nearest the neck. The names applied to different portions of the loin vary considerably in different localities. The part nearest the ribs is frequently called "small end of loin" or "short steak." The other end of the loin is called "hip sirloin" or "sirloin." Between the short steak and the sirloin is a portion quite generally called the "tenderloin," for the reason that the real tenderloin, the very tender strip of meat lying inside the loin, is found most fully developed in this cut. Porterhouse steak is a term most frequently applied either to the short steak or the tenderloin. It is not uncommon to find the flank cut so as to include more of the loin than is indicated in the figures, in which case the upper portion is called "flank steak." The larger part of the flank is, however, very frequently corned, as is also the case with the rump. In some markets the rump is cut so as to include a portion of the loin, which is then sold as "rump steak." The portion of the round on the inside of the leg is regarded as more tender than that on the outside, and is frequently preferred to the latter. As the leg lies upon the butcher's table, this inside of the round is usually on the

upper or top side, and is therefore called "top round." Occasionally the plate is called the "rattle."

Cuts of Lamb and Mutton

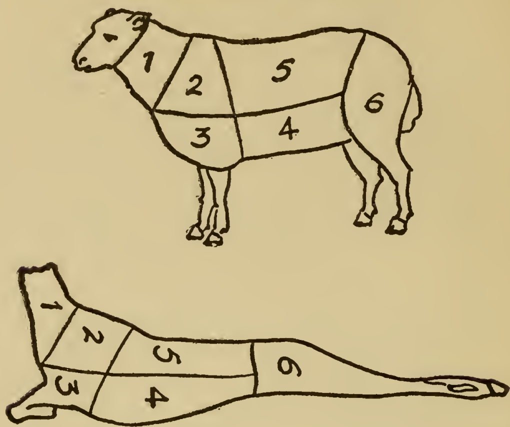


Fig. 7

Fig. 7.— Diagrams of cuts of lamb and mutton: 1, Neck; 2, chuck; 3, shoulder; 4, flank; 5, loin; 6, leg.— (Atwater and Bryant, Bulletin No. 28, Office of Experiment Stations, United States Department of Agriculture.)

Fig. 7 shows the relative position of the cuts in a dressed side of mutton or lamb and in a live animal. The cuts in a side of lamb and mutton number but six, three in each quarter. The chuck includes the ribs as far as the end of the shoulder blades, beyond which comes the loin. The flank is made to include all the under side of the animal. Some butchers, however, make a large number of cuts in the forequarter, including a portion of the cuts marked "loin" and "chuck" in Fig. 7, to make a cut designated as "rib," and a portion of the "flank" and "shoulder" to make a cut designated as "brisket." The term "chops" is ordinarily used to designate portions of either the loin, ribs, chuck or shoulder, which are either cut or "chopped" by the butcher into pieces suitable for frying or boiling. The chuck and ribs are sometimes called the "rack."

ENERGY VALUE OF MEAT

See Table, under names of meat, as Beef — Mutton — Lamb — Bacon — Ham, etc.

See Table, page 64, for energy value of other ingredients.

TO BROIL STEAK

Wipe, trim off the superfluous fat and remove a little of the bone. Save the flank ends for broiled meat cakes. Heat and grease the broiler with some of the fat. Place meat in broiler with fat edge next to handle and broil over a clear fire, turning every ten seconds for the first minute, holding broiler near the coals that the surface may be well seared, thus preventing escape of juices; then cook at lower temperature, holding the broiler higher.

Steak cut one inch thick will take five minutes if liked rare, and eight minutes if well done; one and one-half inch thick, eight to ten minutes. Serve on a hot platter and season with butter, salt and pepper, or with Maître d'Hôtel Butter.

Note.— Steak should be cut at least one inch thick; many prefer it much thicker. The most tender steaks are tenderloin, sirloin and cross-cut of rump. Sirloin, porterhouse (a thick slice of sirloin with tenderloin attached), cross-cut of the rump and top of the round are all good steaks. The top of round is solid meat and a cheap steak; is tender if cut from animal of right age and is the second or third cut from top of round.

MAÎTRE D'HÔTEL BUTTER, 443 CALORIES

¼ cup butter.
½ teaspoon salt.
½ saltspoon pepper.
1 tablespoon chopped parsley.
1 tablespoon lemon juice.

Rub the butter to a cream; add salt, pepper, parsley and lemon juice. Spread on hot beefsteak.

PAN-BROILED BEEF CAKES

Use steak from upper part of round, and with a small piece of suet put all through a meat chopper; without seasoning,

shape into small, flat, circular cakes. Into sauté pan put a little beef fat, when smoking hot, put in the cakes and cook a few moments on each side and turn; it will take about five minutes to cook them. Season well with salt, pepper and butter, and serve on hot platter. Do not add salt before cooking, as it toughens the meat.

SCRAPED BEEF

See "Beef Preparations" for recipe. Page 217.

MUTTON CHOPS BROILED[1]

Cut away the tough outside skin, trim off a part of the fat. Broil same as steak — that is, close to the glowing coals — for about one minute, turning every ten seconds, then cook at a lower temperature, holding the broiler higher. Will take four or six minutes for a chop one inch thick. Mutton, like beef, should be served rare. Season chops with salt and pepper, but not with butter, as the meat is rich and fat and does not require it.

LAMB CHOPS BROILED[1]

Prepare and broil same as for mutton chops, except that they are to be well done instead of rare, to accomplish this about three minutes longer cooking will be required; for a chop one inch thick, from eight to ten minutes.

FRENCH CHOPS[1]

Trim a chop until there is nothing left but the round muscle at the thick end, with a little fat about it. Cut away all the meat from the bone, which will then look like a handle with a meat morsel at one end. Broil, and serve on hot platter with paper handles on chops, and garnished with parsley and peas.

PAN-BROILED CHOPS[1]

Chops are fairly good pan-broiled. The same principle is to be followed as in the cooking over coals — that is, a high degree of heat at first, to sear the outside before the juice

[1] Chops average 300 Cal. per 100 gms.

escapes, and a lower temperature afterward — therefore, heat the sauté pan or spider exceedingly hot (use no fat), drop in the chop, count ten and turn, repeating for about one minute, then draw the pan to the back or side of the stove and finish cooking slowly. A chop one inch thick will be perfectly done in from five to seven minutes. If the pan is hot enough at first there will be no loss of juice or flavor. Season and serve in the same manner as broiled chops.

CHOPS (OR BIRDS) BROILED IN PAPER [1]

Prepare a chop as for pan-broiling. Spread a piece of paper evenly and thickly with butter. Lay on it a nicely trimmed chop and double the paper with edges together. Fold and crease the edges on the three sides, then fold and crease again, so that the butter cannot run out. These folds should be half-an-inch wide. It will be necessary to have the sheet of paper — foolscap or heavy white paper — considerably more than twice as large as the chop. Broil over coals, not too near, *turning often* so that the temperature will not get so high as to ignite the paper. A chop broiled in this way is basted in the butter and in its own juices, and is very delicate. A chop three-quarters of an inch thick will cook in five minutes; one an inch thick, in eight.

Should the paper ignite, it need not destroy the chop. Take it out and put into a fresh paper and try again. The chop should be served hot, seasoned with salt and pepper.

Note.— Birds may be broiled in the same way.

BROILED BACON

Cut bacon in as thin slices as possible, and remove rind. Put in broiler, placing broiler over baking pan, and cook in hot oven until crisp.

CURLED BACON

Heat sauté pan very hot. Put in strips of very thin sliced bacon. As fat is drawn out, pour it off into cup; cook bacon until crisp and brown. Drain on brown paper.

[1] Chops average 300 Cal. per 100 gms.

BROILED HAM

Cut slices of ham one-third inch thick. If very salt soak fifteen minutes in lukewarm water; broil three minutes or until brown on both sides, turning frequently. A slice of boiled ham is very delicate cooked in this same way, cooking it less time.

ROAST MEATS

Prepare meat, put on rack in dripping pan, dredge with salt and flour and cook in hot oven until the surface is seared, reduce the heat and cook slowly the required time.

Beef, rare	13 minutes per pound.
Beef, rare (over 5 lbs.)	18 minutes per pound.

GRAVY FOR ROAST MEATS

1 tablespoon fat.
1 tablespoon flour.
1 cup boiling water.

Pour fat from baking pan and return to pan the quantity desired. Add flour and when well browned pour on gradually the boiling water, stirring constantly. Cook five minutes, season with salt and pepper, and strain.

POULTRY AND GAME[1]

Poultry and game are generally classed together, poultry being applied to domesticated birds raised for their flesh or eggs or both. Wild birds are all classed as game.

Digestibility. Chicken may be introduced early into the dietary of the convalescent, for it is one of the most easily digested of meats. Chicken is more easily digested than fowl, but is not as nutritious. The white meat of the breast is particularly free from fat, has short fibers and small amount of connective tissues, and is easier to digest than the dark meat.

Squab, quail, pigeons and the white meat of turkey are also easily digested.

Duck and goose contain a large quantity of fat and are not as easily digested.

[1] For further information, note "Poultry as Food." Farmer's Bulletin, No. 182, Dept. of Agriculture, Washington. D. C.

Game is comparatively easy of digestion but too highly flavored for most invalids. The cuts from the breast are the best for an invalid.

Test for Selecting a Chicken. The cartilage at the end of the breast bone must be soft and pliable, the skin smooth and the feet soft. There should be an abundance of pin feathers. Chickens are used for broiling and roasting.

Test for Selecting a Fowl. The cartilage at end of the breast bone is firm, the feet are hard and dry. The pin feathers are largely replaced with long hair. An old fowl, not too fat, is best for broths. One from one to two years is best for roasting, or where the meat substance is desired. The proportion of bone to meat in chicken under this age makes them expensive eating.

Principles of Cooking. In general same as for cooking of other meats.

When the layer of meat over the bones is very thin, as in young chickens or squabs, broiling is preferable to roasting.

An old fowl can sometimes be made tender without having all its flavor stewed into the broth, by cooking in a small amount of water in a double boiler for a long time, or in a fireless cooker.

A general rule for roasting chickens or turkeys is twenty minutes to the pound. Ducks and geese, having tougher fibers, require a longer time for thorough cooking.

GENERAL RULE FOR CLEANING POULTRY

Cut off head and feet and pull out pin feathers. If the bird has not been drawn, make an incision below the breast just large enough to admit the hand (or finger for the small birds). With the hand or finger, draw all the entrails out at one time. Care must be taken not to break them, especially the gall-bladder. Turn down the skin of the neck, cut off neck close to body and pull out wind pipe and crop. Cut out the oil bag. Cut through skin of the leg a little below the joint (not cutting the tendons), press against table and break and pull off foot with tendons, which will come out in break-

ing if chicken is young. In fowls you may have to pull them out separately with skewer. Singe the bird by holding it over a tablespoon of burning alcohol, or paper (holding over sink). Wash by allowing the cold water to run through and over it, and dry well inside and out and prepare further for broiling or roasting, etc.

DRY DRESSING FOR STUFFING, 1100 CALORIES

1½ cup stale bread crumbs.
⅓ cup butter (not melted).
Salt, pepper.
Powdered sage, marjoram, and summer savory.

Thoroughly mix ingredients and season to taste. Fill in both openings of bird and sew the skin at both ends, and turn the skin of neck over, and fasten to back. Oysters can be added to dressing if desired, omitting all seasonings but the salt and pepper.

TO TRUSS POULTRY

After stuffing and sewing up the openings, draws the thighs close to body and secure in place by putting a skewer through them and the body. Fold wings under back by taking end of wing and place in under back which fastens it. Cross the drum-sticks and tie with long string and fasten to the tail, and tie string so that it will hold thighs close to the body. Cut and remove string before serving the bird.

ROAST POULTRY

100 grams = about 200 Calories.[1]

Clean, stuff and truss bird and place it on its back on rack in dripping pan. Rub surface with salt and a butter and flour mixture (mix three tablespoons of butter and two tablespoons of flour and stir until creamy). Dredge bottom of pan with flour. Place in hot oven and in about ten minutes the flour should be well browned, then reduce heat of oven and cook more slowly. Baste every ten minutes with one-fourth cup of butter melted in three-fourths cup of water, after this

[1] Edible portion.

has been exhausted use fat in pan. Turn bird often while cooking that it may brown evenly. When cooked, remove to *hot* platter and make the gravy.

A chicken four to five pounds will require about one and one-half to two hours for cooking. Turkey, nine pounds, two and one-half to three hours. Ducks (domestic), one to one and one-half hours. Duck (wild), twenty-five to thirty minutes. Goose, nine pounds, two to two hours and one-half.

GRAVY FOR ROAST POULTRY

Clean the heart, liver and gizzard by removing the membrane, blood vessels and clotted blood from the heart. Cut liver from the gall bladder and remove all green on liver. Clean gizzard and cut through edge carefully to sac, and remove carefully not to break it, wash giblets (that is, the heart, liver, gizzard) and the neck and put on to cook in two and one-half cups of cold water, cook slowly at the simmering point until tender.

After chicken has been removed from pan, pour off all the fat, strain and return to pan four tablespoons of fat and add four tablespoons of flour, brown together thoroughly, and add gradually the water the giblets were cooked in. Cook five minutes, stirring constantly, add hot water if gravy is too thick, and salt and pepper to taste, and the finely-chopped giblets.

TO BONE BIRDS

Select bird that is fresh-killed, dry-picked, and not drawn. Cut off head and feet, singe and remove pin feathers, crop, and oil bag. Cut off wings close to body. Lay on board breast down and cut to bone the entire length of spine. Scrape the flesh from backbone the entire length of body, working toward the breast, cutting the tendinous portions as reached. When edge of breastbone is reached, care must be taken not to break through skin. Scrape flesh from second joint and drumsticks, laying flesh back and pulling out bone (as if turning glove off inside out).

Scrape flesh from lower part of back and withdraw from

carcass. Put flesh in original shape and broil, following directions for broiled quail; or stuff bird with stale bread crumbs and tie in shape with string and bake in hot oven. When cooked, remove bread and tie in shape with a bit of white baby ribbon and garnish with parsley and lemon.

BROILED QUAIL

100 grams = 160 Calories.

Clean, cut off the head and feet, singe, and wipe with a damp cloth. With a sharp-pointed knife split the quail down the back, beginning at back of neck and cutting through the backbone the entire length of bird. Lay bird open and remove contents. Cut through tendons at joints. Wipe thoroughly. Season with salt and pepper, rub thickly with softened butter and dredge with flour. Broil ten minutes over clear coals. Serve on hot buttered toast. Garnish with toast points, parsley and currant jelly.

BROILED SQUABS

100 grams = 390 Calories.

Prepare, cook and serve the same as quail.

BROILED SMALL BIRDS

All small birds can be broiled according to the directions for quail, remembering that for very small ones it takes a very bright fire, as the birds should only be browned and the time required for cooking is brief.

BIRDS BROILED IN PAPER

See chapter on Meats and follow directions for "Chops Broiled in Paper." Page 151.

BROILED CHICKEN

100 grams = 108 Calories.[1]

Dress for broiling, following directions given under Broiled Quail. Season well with salt and pepper, and rub all over with softened butter, especially breast and legs. Put in a well-greased broiler and broil over a clear fire about fifteen

[1] Edible portion.

minutes, turning often. The flesh side must be exposed to the fire the greater part of the time as the skin side burns easily. When chicken is nicely browned, place in a dripping-pan, skin side down, in a moderate oven twelve minutes. Put on a hot dish, season with salt, pepper and butter, and serve immediately.

This rule is for a chicken weighing about two and a half pounds, yielding 725 calories.

CREAMED CHICKEN, 210 CALORIES [1]

(Individual Rule.)

1/3 cup cold cooked chicken.	1/2 tablespoon butter.
Speck celery salt.	1/2 tablespoon flour.
Salt.	1/4 cup rich milk.
Pepper.	

Melt butter in saucepan, add flour and pour on gradually the scalded milk. Cook thoroughly. Add chicken cut into dice, and seasonings. Heat well and serve on toast rounds, garnished with toast points and parsley; or use as a filling for Swedish timbales.

Note.— Chicken may be used that is removed from chicken broth when it is tender. Chicken broth may replace part of the milk in making the sauce.

SCALLOPED CHICKEN

Put creamed chicken into a small baking dish, cover with dried bread or cracker crumbs, dot with small pieces of butter, and brown in oven.

JELLIED CHICKEN, 100 CALORIES [2]

(Individual Rule.)

1 teaspoon gelatin.	1/4 cup chopped chicken.
2 tablespoons cold water.	Salt, celery salt.
8 tablespoons strong chicken broth.	

Soak gelatin in the cold water five minutes, and add the boiling hot broth, stir until dissolved. Season to taste. Dip

[1] Calculated with 1 1/2 ounce of fowl.
[2] About 100 calories.

mold into cold water and pour in enough gelatin to cover bottom, put in ice box to harden, when firm decorate with a slice of hard-cooked egg; or cook a couple slices of carrots and cut a small round from one slice to form the center of a daisy and cut the other slice into strips to represent the petals and put in bottom of mold, add a few drops of gelatin to keep the decoration in place, and put on ice to harden. Mix the chicken with remainder of gelatin and pour into mold and set to harden. Serve on leaf of lettuce or garnish with parsley.

LARDED GROUSE

Clean and wash the grouse. Lard the breast and legs. Run a small skewer through the legs and tail. Tie firmly with twine. Dredge with salt, rub the breast with softened butter, then dredge with flour. Put into a quick oven. If desired rare, cook twenty minutes; if well done, thirty minutes. Serve on hot platter garnished with parsley and Bread Sauce.

LARDED QUAIL

100 grams = 160 Calories.

The directions for cooking and serving are the same as for grouse, except that quail cook in fifteen minutes. Larding gives richness to dry meat that does not have fat enough of its own.

BREAD SAUCE FOR GAME, 540 CALORIES

Crumbs

1/3 cup coarse dried bread crumbs.	1/8 small onion.
1/2 tablespoon butter.	1 tablespoon butter.

Sauce

1 cup milk.	Salt.
1/4 cup fine bread crumbs.	Pepper.

Prepare Crumbs. Dry in a warm oven; sift. Cook the coarse bread crumbs in the butter until a delicate brown, and use to cover breast of bird.

Prepare Sauce. Put the fine bread crumbs, milk and

onion on to scald ten minutes, then skim out the onion, add the butter and seasoning, and serve as a gravy for birds.

FISH

Fish is one of the important protein foods. The term is usually applied to all kinds of water animals used for food. They may be classified as follows:

Classes
- 1. Scaly or Vertebrate
  - White or lean, e. g.
    - Halibut
    - Haddock
    - Flounder
    - Turbot
    - White Fish
    - Smelt
    - Cod
  - Dark or oily, e. g.
    - Salmon
    - Mackerel
    - Blue Fish
    - Shad
    - Herring
    - Eel
- 2. Shell-fish
  - Mollusks, e. g.
    - Oysters
    - Clams
  - Crustaceans, e. g.
    - Crabs
    - Lobsters
    - Shrimps
    - Turtles
    - Terrapin

In the white-fleshed fish the fat is found principally in the liver. This is the only class usually considered in the cookery for the sick.

In the dark-fleshed fish the fat is found distributed throughout the body. A considerable amount of the protein of fish is in the form of gelatin. Fish is less rich in extractives, and hence less stimulating than meat.

Digestibility. The digestibility of scaly fish depends upon the quantity of fat present and the coarseness of the fiber.

The white-fleshed fish are less nutritious and stimulating than the dark-fleshed fish as they contain less fat and extractives and more water. They are consequently more easily digested. With the exception of cod, white fish is useful for a convalescent diet, for those of sedentary habits, for children, and others for whom the stimulating extractives of meat are not desirable.

Oily fish should not be eaten by those of weak digestion or given to the sick. In some cases they may be served during advanced convalescence.

Salt fish is not as easily digested as fresh fish, as the fibers are apt to be hardened in the process of salting. Salt codfish is an exception, for if finely divided and served in an appetizing manner it is a valuable and inexpensive form of protein food. As a rule, dried, smoked or pickled fish should not be given to the sick.

By some persons, fish cannot be eaten without causing indigestion or biliousness. A complete diet of fish is said to cause an affection of the skin. The fat sometimes disagrees, causing acidity and eructations of the stomach.

Composition. In composition fish is similar to meat, containing proteins, extractives, fats, salts and water. As a rule, fish contains more water and less fat than meat, therefore it is more easily digested; and it is due to this, its easy digestibility, that white fish by some is considered a brain food, and not, as is popularly supposed, to the amount of phosphorus it contains; in fact, fish does not contain as much phosphorus as some meat. Fish contains less extractives than meat and it is due to this that people tire more quickly of it than of meat.

Lemon juice and vinegar are desirable condiments to serve with fish. The acid is a desirable neutralizing agency, as the juice of fish, especially shellfish, is of an alkaline nature.

Nutritive Value. The chief nutritive constituents of fish, as of meat, are their proteins and fats. Their energy value depends largely on the amount of fat they contain.

When Fish are in Season. Halibut, haddock, flounder and cod, are in season all the year.

Turbot, October to May; shad, February to May; salmon, May to September; blue fish and mackerel, May to October; sturgeon, April to September; trout (lake), April to August.

Test for Freshness. In fresh fish the gills are red, the eyes bright and protruding, the flesh is firm and there is no unpleasant odor. The first two tests disappear after the fish has been out of water a short time, and although the flavor of the fish is not as good, it is not spoiled. But if the last two tests are not present the fish should not be used. Great care should be taken that fish is perfectly fresh, in season, and thoroughly cooked, or it will be indigestible and sometimes poisonous. Unless these conditions are known to exist, fish should not be served to the sick.

"In many European cities fish are sold alive, the customer selecting his fish as it swims in a tank. It would seem that this excellent method might be used in our cities, especially those situated on the seaboard, at least for customers who are fastidious and who are willing to pay an extra price for a special article when it is warranted." (Farmer's Bulletin No. 375.)

Principles to be Observed in Cooking Fish. As in meat, albumin is the principal constituent to be considered in the cooking of fish. Hence the same principles which apply to the cooking of meat apply also to the cooking of fish.

See page 11, for effect of heat on albumin.

Objective Points and Methods:

To Retain the Juice.— Baking, Broiling, Boiling and Frying.

To Extract the Juice.— Soup.

To Extract and Retain the Juice.— Chowder.

ENERGY VALUE OF FISH

See Table, under names of fish, as Halibut, Salmon, etc.

See Table, page 64, for energy value of other ingredients.

BROILED FISH

White fish, trout, small blue fish, mackerel, shad and small cod should be split down the back, and broiled whole, and if preferred, cut off the head and tail. Halibut and salmon should be cut into inch slices and turned often while broiling.

Clean Fish. Wipe with a cloth wet in salt-water, and dry on a fish towel. Season; oily fish need only salt and pepper, but dry white fish should be spread with butter and salt and pepper before broiling. Use a double wire broiler greased well with salt pork rind. Put thickest edge of fish next middle of broiler, turn often while broiling; with split fish sear the flesh side first and then turn.

The time of cooking will vary with the thickness of fish. Fish is done when flesh separates easily from the bone.

The fire should be hot and clear. When ready to serve, loosen the fish from broiler on each side. Open broiler, slide fish onto platter, having flesh side uppermost. Spread with butter, salt and pepper. Garnish with parsley and slices of lemon. Or serve with Butter Cream and a border of potato balls.

Note "Fish Sauces" for Butter Cream.

BAKED FISH

Clean fish. Wipe with cloth wet in salted water, dry on a fish towel and bake on a greased fish sheet, placed in a dripping pan. A strip of cotton cloth, by which it may be lifted from the pan, may be substituted for the fish sheet. Sprinkle with salt and pepper, brush over with melted butter, dredge with flour, and place around fish small pieces of fat salt pork. Bake in hot oven until fish separates from bone when lifted with fork. Baste every ten minutes. Serve plain with melted butter, or with Egg Sauce.

Note "Fish Sauces" for Egg Sauce.

HALIBUT A LA CREOLE, 413 CALORIES

½ pound halibut.
½ cup tomatoes.
¼ cup water.
Small piece onion.
Sprig parsley.
1 clove.
½ teaspoon sugar.
¾ tablespoon butter.
¾ tablespoon flour.
Salt and pepper.

Tomato Sauce. Blend tomatoes, water, onion, parsley, clove and sugar, and cook ten minutes.

Melt the butter, add the flour and pour on gradually the hot mixture. Add salt and pepper to taste, cook five minutes and strain.

Clean fish. Wipe with cloth wet with cold salted water and dry thoroughly. Put in baking tin, pour around half the sauce and bake until fish separates easily from bone, basting often. Serve on hot platter, pour around it the remainder of the sauce and garnish with parsley.

CREAMED FISH

(Individual Rule.)

½ cup cooked fish, remove skin and bone, and flake the flesh with a fork; season with salt, pepper, and a little lemon juice.
¼ cup cream or white sauce (note Fish Sauces).

Blend the fish and white sauce, reheat and serve on toast, garnish with parsley and half-slice of lemon; or serve in bread cases made of slices of bread cut two inches thick, round off edges, scoop out center, leaving case, brush with softened butter and brown in oven.

Note.— White sauce may be poured on one egg yolk before adding fish.

SCALLOPED FISH

Put creamed fish into small baking dish, cover with dried bread or cracker crumbs; dot with bits of butter and brown in oven.

CREAMED CODFISH, 828 CALORIES

Flake salt codfish in small pieces, remove the bone; the fish should be put into several cold waters to remove some of the

salt. Prepare the potatoes, cutting them into eighths, or if small into fourths, add the shredded fish and boiling water to cover; cook until potatoes are tender, drain off the water (saving it for the sauce), add a little butter and season with pepper, and mash lightly and heap in center of platter.

Sauce

1 pint fish and potato water.	4 tablespoons flour.
4 tablespoons butter.	Pepper.

Melt the butter, add the flour and pour on gradually the potato water. Cook thoroughly, season with pepper, and pour about the codfish, and garnish with slices of hard-cooked egg and parsley.

CREAMED CODFISH (FOR THE DIABETIC), 314 CALORIES

½ cup flaked codfish.	½ teaspoon Gum Gluten flour.
1 cup milk or cream.	Yolk 1 egg.
½ teaspoon butter.	Pepper.

Soak the fish in two waters; melt the butter, add the flour and pour on gradually the scalded milk; cook thoroughly, add codfish and egg, cook five minutes, season and serve on Gum Gluten toast or fresh bread.

CREAMED FISH (FOR THE DIABETIC), 208 CALORIES

½ cup cooked fish.	½ cup cream sauce.
Salt, pepper, lemon juice.	Gum Gluten bread crumbs.

Season fish with salt, pepper and lemon juice, add cream sauce, put into ramikins or cups, sprinkle with Gum Gluten crumbs, and bake.

BAKED FISH (FOR THE DIABETIC), 480 CALORIES

For baked fish make a dressing with one cup of Gum Gluten bread crumbs, one-half an onion, chopped fine; one tablespoon celery, chopped fine, one tablespoon of butter; pepper, salt, lemon juice and parsley.

FISH (FOR THE DIABETIC)

Fish should be rubbed with salt and pepper and dipped in Gum Gluten Flour, or rolled in egg and Gum Gluten Cracker crumbs. Sauté (or fry) in oil or butter.

FISH SAUCES

BUTTER CREAM

Cream a little butter; season with salt, cayenne, lemon juice (speck salt and pepper, one-half teaspoon lemon juice). Add finely minced parsley or chopped pickle, such as cucumber or olive. Prepare quantity according to size of fish. Put it on the fish, and place in oven a moment until butter is melted.

CREAM OR WHITE SAUCE, 125 CALORIES

(Individual Rule.)

½ tablespoon butter.	⅓ cup hot milk.
½ tablespoon flour.	Salt.

Melt butter, add flour, remove from fire, and pour on gradually the milk, stirring constantly. Bring to the boiling point, cook thoroughly and season.

Note.— Extra milk may be added if a thinner sauce is desired, using one-half cup milk.

CREAM SAUCE (FOR THE DIABETIC), 138 CALORIES

½ cup milk.	Salt.
1 teaspoon Gum Gluten flour.	Cayenne.
1 teaspoon butter.	

Melt the butter, add the flour and pour on gradually the scalded milk; cook thoroughly and season.

EGG SAUCE, 434 CALORIES

2½ tablespoons butter.	Speck pepper.
1½ tablespoons flour.	¾ cup hot water.
¼ teaspoon salt.	2 eggs.

Melt one-half the butter; add flour and seasoning and pour on gradually the hot water. Boil five minutes and add remainder of butter in small pieces. Add two hard-cooked eggs cut into one-fourth inch slices, or the beaten yolks may be added to hot sauce with one-half teaspoon lemon juice.

EGG SAUCE NO. II

To Cream or White Sauce add one hard-cooked egg chopped fine and a little lemon juice if desired; or add to White Sauce, yolk slightly beaten and a few drops of lemon juice.

TOMATO SAUCE, 80 CALORIES

½ tablespoon butter.
½ tablespoon flour.
¼ cup strained tomato juice.
Few grains salt.
Few grains pepper.

Brown butter, add flour and stir until slightly browned; remove from fire and pour on gradually, stirring constantly, the heated tomato. Cook thoroughly and add salt and pepper.

Note.— A sprig of parsley, one clove and a small piece of onion may be added to tomato while heating.

CUCUMBER RELISH, 15 CALORIES

Grate one-half cucumber and add a small piece of red pepper chopped fine; season with salt, pepper and vinegar and serve with fish.

HOLLANDAISE, 484 CALORIES

1 egg yolk.
4 tablespoons butter.
½ tablespoon vinegar.
⅛ teaspoon salt.
White pepper.
3 tablespoons boiling water.

Put one tablespoon butter in top of double boiler, add the other ingredients. Place over hot water and stir constantly while butter is melting. Add second tablespoon of butter and stir until melted, repeat this process until all butter is used. As soon as the mixture begins to thicken remove from hot water. Vary by adding a little chopped parsley, grated horse-radish root.

SHELL-FISH

OYSTERS AND CLAMS

Only the mollusks are considered in this book, because the crustaceans are not easily digested, and therefore are not suitable for an invalid diet.

Oysters. Oysters are valuable food for invalids and con-

valescents. Their nutritive value is not high, but they are easily digested and possess a delicate flavor which is acceptable to most palates.

Composition. The five food principles are represented in oysters. Reckoned as "solid," i. e., removed from the shell, oysters contain 88.3 per cent. of water, 6.1 per cent. protein, 1.4 per cent. fat, and 3.3 per cent. carbohydrate. Oysters come nearer to milk than almost any other common food material, both in amount and proportion of nutritive principles.

The carbohydrate is in the form of glycogen, being found in the liver, which constitutes a large proportion of the oyster.

Digestibility. The soft part of the oyster or clam is made up largely of the stomach and liver and is easily digested when cooked in a variety of ways — broiling, roasting, stewing, panning and steaming — but not fried when served to the sick.

The hard part of shellfish is the muscle which fastens the animal to the shell, and is rendered tougher by all forms of cooking; therefore, when whole oysters are to be eaten, they are more easily digested when served raw or broiled slightly in the shell. They can be digested by fever patients and those suffering from many forms of gastric disorders.

It is desirable in acute illness to serve only the soft part of the oyster, but in the later stages of convalescence the whole oyster can be served raw or in stew and soups, which are recommended on account of their liquid form and warmth.

When in Season. Oysters are in season from September to May. During the rest of the year they are insipid and unfit for food.

Principles to be Carefully Observed in Serving and Cooking Oysters for the Sick. (a) Make every effort to have the oyster alive when used, or as fresh as can be obtained from a reliable dealer. Many serious cases of illness and even death have been caused by eating oysters so long dead that poisonous substances had formed in them. Great care should also be taken that oysters are not procured from beds where

the water has been contaminated in any way. "As it is in general impossible to learn their origin the rule of never eating them in the raw state is adopted by many. The practice of fattening or 'floating' oysters in fresh or in brackish water robs them of much of their fine flavor, and since the most accessible supply of such water is at the outlet of streams, and as such streams are frequently polluted by sewage, many persons believe that this practice should be forbidden by law."[1]

(b) Oysters contain an albuminous substance which increases in hardness with an increase of temperature, just as the albumin of an egg does. When oysters are cooked with reference to this albuminous substance, they are also cooked in the best possible manner with reference to their other constituents; therefore subject them to a low temperature, for a short time, bearing in mind that 160 to 180 degrees Fahrenheit is the cooking temperature of albumin.

General rule is to remove the oyster from heat as soon as the body grows plump and the edges curl, if cooked beyond this stage they are over-cooked.

Varieties. In New York State the "Blue Points" are considered the finest for serving raw. They come originally from Blue Point, Long Island.

In Massachusetts the "Cove" Oyster is considered the finest for serving raw. They come from a still water cove near Plymouth.

Clams. Clams are similar in composition to the oyster and same general rules followed in preparing and serving. They are much used for food and considered a great delicacy. They contain a tough portion that is not used in sick-room cookery, but the clear juice, on account of its digestibility and stimulating properties, is invaluable in the sick room. Clams are in season all the year around.

Varieties. There are two varieties, the hard and soft shell clams. The hard shell are known as quahaugs. The small

[1] Farmer's Bulletin No. 375.

or round "little neck clams" take the place of Blue Points to serve raw when oysters are out of season.

ENERGY VALUE OF OYSTERS

2 oysters	= 14 Calories.
100 grams oysters	= 50 Calories.
1 cup (solid) oysters	= 84 Calories.

See Table, page 64, for energy value of other ingredients.

RAW OYSTERS

Wash, scrub the shells well under a stream of water with a vegetable brush. With a hammer break the thin edges of the shell so that a knife may be inserted to sever the muscle which holds the two parts of the shell together; when this is cut remove the upper half and wipe the edges free from any grains of sand. Then sever the muscle which joins the oyster to the other shell, so that it may be easily lifted out without the necessity of cutting. Arrange six oysters on an oyster-plate on crushed ice, and serve with salt, black pepper and lemon juice. A quarter of lemon cut lengthwise may be placed in the center of plate, and bit of parsley.

OYSTERS ROASTED IN THE SHELL

Wash the shells very carefully with a brush. Put them in a wire broiler over glowing coals, the round side of shell down so as to hold the juice. Cook them quickly, turning once or twice until the shell opens. They may also be cooked in a hot oven. When done remove the upper half of the shell; season them quickly with salt, pepper and a tiny bit of butter and vinegar, if liked, and serve them while very hot.

The true oyster flavor is delightfully developed by preparing in this way. They may also be served with melted butter, salt, pepper and lemon juice.

TO WASH OYSTERS

Place oysters in strainer over a bowl and pour one tablespoon of water over each one-half cup of oysters. Take each oyster up in fingers and remove any particle of shell that may adhere to tough muscle.

PAN ROAST OYSTERS

Wash oysters and put in sauté pan or chafing dish and gently stir with spoon. When bodies grow plump and the edges curl remove from heat. Season with salt and pepper and a little butter and serve on rounds of toast, with eighth of lemon for individual dishes; or serve on platter and garnish with toast points, watercress and lemon.

BROILED OYSTERS, 320 CALORIES

(Individual Rule.)

4 oysters.	4 teaspoons butter.
1/4 cup cracker crumbs.	Salt and pepper.

Select large oysters. Wash, drain and dry between towels. Melt butter. Season cracker crumbs with salt and pepper. With silver fork lift each oyster by tough muscle, and dip first in butter, then in crumbs. Place on a buttered fine wire broiler and broil, turning often until brown and the juice begins to flow. Serve plain, garnished with parsley and a piece of lemon or prepare cream toast and sprinkle with fine chopped celery, and place the broiled oysters on top.

CREAMED OYSTERS, 284 CALORIES [1]

(Individual Rule.)

8 oysters.	1/2 cup rich milk or thin cream.
1 tablespoon butter.	Salt.
1 1/4 tablespoon flour.	White pepper.

Wash, drain and dry oyster between towels. Melt butter and remove from fire, add the flour and pour on gradually the scalded milk. Season with salt and pepper. Cook thoroughly. Add the oysters and heat until the edges curl and the bodies grow plump. Serve at once on rounds of toast and garnish with toast points and parsley or in crisped "bread cases." See "Creamed Fish."

CREAMED OYSTERS NO. II, 340 CALORIES [2]

(Individual Rule.)

1/2 cup thin cream or rich milk.	1 teaspoon butter.
1 tablespoon flour.	8 oysters.
1/4 teaspoon salt.	

[1] Calculated with whole milk.
[2] Calculated with thin cream.

Wet the flour with a little cold milk; scald the cream, add the flour and cook well. Just before serving add the drained oysters and cook until they grow plump and the edges curl; add the salt and butter. Serve in Swedish timbale shells, little scooped-out buns, or on rounds of toast.

SCALLOPED OYSTERS, 365 CALORIES

(Individual Rule.)

½ cup oysters.	Salt.
¼ cup cracker crumbs.	Pepper.
⅛ cup stale bread crumbs.	½ tablespoon cream.
1 tablespoon melted butter.	1 tablespoon oyster liquor.

Prepare the oysters. Stir together crumbs and melted butter. Butter a small baking dish and sprinkle part of the crumbs in it. Put in half the oysters, sprinkle with salt and pepper, then a layer of crumbs, pour over enough cream or oyster liquor to moisten well, add the remaining oysters, season, and finish with a layer of crumbs on top. Bake in a hot oven about ten minutes, till oysters are plump and crumbs browned. Serve hot.

Never allow more than two layers as they will not cook evenly. A sprinkling of mace or nutmeg is considered an improvement by some. Sherry wine may be used in place of cream.

OYSTER SOUP, 252 CALORIES

(Individual Rule.)

½ cup oysters.	1 tablespoon butter.
¼ cup water.	¾ tablespoon flour.
½ cup milk.	Grating of mace.
Bit of onion.	Salt and pepper.

Scald the milk. Melt the butter, add the flour and pour on gradually the scalded milk; add mace and onion, and cook thoroughly.

Put oysters in a strainer placed over a bowl, add water and carefully pick over oysters to remove particles of shell. Heat liquor which has drained from oysters to the boiling point, strain through two thicknesses of cheese-cloth and return to

saucepan, add oysters and cook until plump and edges curl. Drain off liquor and add to soup. Season, add oysters and serve immediately.

OYSTER SOUP (FOR THE DIABETIC), 107 CALORIES

(Two Servings.)

One-half pint of oysters, heated in their own liquor; strain. Put in saucepan one-half teaspoonful butter and a scant half-teaspoonful of Gum Gluten Flour, add liquor, and, when slightly thick, oysters, pepper and salt. For variety, add occasionally a tablespoonful of cream.

OYSTER STEW, 205 CALORIES

(Individual Rule.)

½ cup oysters.
⅔ cup milk.
¾ tablespoon water.
¼ teaspoon salt.
Speck pepper.
½ tablespoon butter.

Scald the milk. Put oysters in a strainer placed over a bowl, and add water. Carefully pick over oysters to remove particles of shell. Heat the liquor which has drained from the oysters to the boiling point, and strain through the finest strainer and cheese-cloth, return to saucepan and put in the oysters and simmer, but *do not boil,* until they begin to grow plump and the edges curl and separate. Strain the liquor into the scalded milk, season, add oysters and serve immediately.

CLAMS

ENERGY VALUE OF CLAMS

½ dozen clams	= 40 Calories.
3⅓ ounces clam bouillon	= 2 Calories.
1 quart clam bouillon	= 23 Calories.

See Table, page 64, for energy value of other ingredients.

LITTLE NECK CLAMS

Serve raw on the half-shell in same manner as raw oysters.

STEAMED CLAMS

For steaming, clams should be bought in the shell. Wash in several waters, scrubbing thoroughly. Put into kettle,

allowing one-fourth cup water to one quart clams. Cover closely and steam until clams partially open. Care should be taken not to overcook them. Serve with melted butter. A few drops of lemon juice may be added to butter.

CLAM BROTH

(Individual Rule.)

1 dozen clams. 2 tablespoons cold water.

Wash clams and scrub with a brush, changing the water several times. Put in saucepan, add water, cover, and cook until shells open. Remove clams from shell, adding liquor which comes from them, to liquor already in saucepan. Strain liquor through double thickness of cheese-cloth. Serve hot, cold, or frozen.

CLAM WATER

(Individual Rule.)

¾ cup cold water. Clam Broth.

To the water add the required amount of the clam broth to make the strength desired. Serve hot, cold, or frozen. When necessary, serve in small quantity and repeat at short intervals.

Note.— Clam broth served in the several ways (as a variety) is invaluable in case of weak stomach, indigestion and general debility.

CLAM WATER NO. II, 17 CALORIES

(Individual Rule.)

¼ cup Clam Broth. Pepper.
1 tablespoon milk. ⅛ teaspoon butter.
½ cup hot water.

Blend the clam broth, milk and hot water, season with pepper and add the butter. Serve hot.

Note.— The pepper and butter may be omitted when necessary.

CLAM STEW, 250 CALORIES

(Individual Rule.)

½ cup clam broth.
½ cup scalded milk.
1 tablespoon butter.
½ tablespoon flour.
⅛ teaspoon salt.
Speck pepper.
Soft part of 1 dozen clams.

Melt butter, add flour, add gradually the scalded milk and clam broth, and cook thoroughly. Season, add clams and serve hot.

CLAM SOUP, 276 CALORIES

(Individual Rule.)

½ dozen clams.
⅛ cup cold water.
1 cup milk.
½ tablespoon butter.
½ tablespoon flour.
Salt and pepper.

Wash and scrub clams and put in kettle with cold water. Cook until shells open. Take from shell and cut off the tough parts; save the soft parts for the soup and keep warm. Scald the milk. Melt the butter, add the flour and pour on gradually the hot milk. Cook thoroughly; add soft parts of clams and juice, season with salt and pepper, and serve immediately and hot.

CLAM BOUILLON, 45 CALORIES

(Two Servings.)

¾ cup cold water.
½ cup clam broth.
⅛ cup scalding milk.
½ teaspoon butter.
Salt.
Pepper.
Celery sauce.
White of egg or whipped cream.

Blend the water and clam broth, heat to the boiling point, then add the scalding milk, the butter, and stir well; season with salt, pepper and celery sauce to taste. A small quantity of cracker crumbs may be added to thicken it. Serve in heated bouillon cups and garnish with two teaspoons of whipped cream or well-beaten white of egg.

CLAM BOUILLON BISQUE, 355 CALORIES

(Two Servings.)

½ tablespoon butter.	½ tablespoon flour.
1 tablespoon chopped onion.	1 cup boiling water.
½ tablespoon chopped carrot.	Yolk 1 egg.
1 cup clam broth.	¼ cup cream.

Melt the butter, add the finely chopped onion and carrot, cover and cook until the onion and carrot are tender, stirring it occasionally. Add the flour, blending well; then pour on gradually the boiling water and the clam broth. Cook five minutes, strain and return to saucepan. Mix the yolk of egg with the cream, and add it slowly to the Bisque. Pour into heated bouillon cups, and serve with small oyster crackers.

ALBUMINIZED CLAM WATER

See "Albuminized Beverages" for recipe. Page 123.

CLAM BROTH NO. II

See "Meat.Broth and Jellies" for recipe. Page 220.

CLAM BROTH ON TOAST

See "Toast" for recipe. Page 258.

CLAM FRAPPE

See "Ices" for recipe. Page 313.

CLAM SHERBET

See "Sherbets" for recipe. Page 312.

EGGS[1]

Many kinds of eggs are eaten, but hens' eggs are the only ones necessary of consideration as a staple article of diet. The shell constitutes about 1.1 per cent. of the weight of the whole egg, the yolk 32 per cent., and the white 57 per cent.

Composition. Eggs are albuminous in nature and consist practically of the following substances — protein, water, fat and mineral matter. The composition of the hen's egg is as follows:

[1] For further information, note "Eggs and Their Uses as Food." Farmer's Bulletin No. 128, U. S. Dept. of Agriculture, Washington, D. C.

	Refuse	Water	Protein	Fat	Ash	Fuel value per pound calories
Whole egg as purchased	12.2%	65.5%	11.9%	9.3%	0.9%	635
Whole egg, edible portion		73.7%	13.4%	10.5%	1.0%	720
White		86.2%	12.3%	0.2%	0.6%	250
Yolk		49.5%	15.7%	33.3%	1.1%	1705

From this table it may be seen that the white of egg consists of eight-tenths water, the remaining portion being principally protein (albumin), with a little mineral matter, etc., the yolk is about half water, one-third fat, and nearly one-sixth protein, with almost twice as much mineral matter as the white.

Varieties. By eggs the product of the domestic fowl are commonly meant. The eggs of the duck, goose, turkey, etc., are edible, but are hardly suited for the sick, because of their stronger flavor. The purely white eggs are usually selected for the invalid, but many regard the brown-shelled egg as the more delicate.

Digestibility. Eggs are easily digested and very thoroughly absorbed in the intestines. If the absorption is delayed, decomposition follows with production of sulphuretted hydrogen and ammonia, which causes considerable gastro-enteric disturbance. The yolk is usually the cause of this disturbance. The digestibility of an egg depends upon its freshness and the manner in which it is cooked. [1] Carelessness in cooking and serving may make an egg difficult of digestion and unappetizing, when, if it is cooked properly, it would be more palatable and easy of digestion. A raw egg, on account of its blandness, does not stimulate the flow of gastric juice and is not as easily digested as a soft-cooked egg; but by heating a raw egg the albumin is finely divided and is more quickly acted upon by gastric juice, consequently is digested about as quickly as a soft-cooked egg. Raw eggs are added to various foods, as milk and broth, etc., to give extra nutriment. Eggs are freely prescribed for those suffering from loss of flesh and strength, as the convalescent, anæmic, or in tubercu-

[1] See Albumin, p. 11.

losis; in such cases as many as twelve eggs being given in as many hours.

A soft-cooked egg digests very quickly.

A medium-cooked egg is not as easily digested as either the raw, soft or hard-cooked, and should not be served cooked in this manner to the sick.

A hard-cooked egg as commonly cooked is difficult to digest, but cooked at proper temperature and chopped very fine will digest about as quickly as a soft-cooked egg.

Nutritive Value. Eggs are a very nutritious food, comparable with meat, milk, cheese, and other animal foods, both as regards total food material and the total protein and fat furnished by them. At twenty-five cents per dozen they are commonly considered very expensive, but this must not be interpreted too literally. Many persons will be satisfied with an egg who would not be with the equivalent food value in the form of meat, and eggs are valuable for giving variety to the diet and for furnishing an easily digested protein food, especially for the sedentary. For children they are much better than meat, because the fat is in an emulsified, and hence easily digested form, and because of their ash constituents. The yolk is rich in compounds of iron, phosphorus, calcium, magnesium. The protein of egg yolk is combined with lecithin, a phosphorized fat which has come to be regarded as an important constituent of food, especially for the growing animal. Egg yolks are frequently prescribed for invalids requiring an easily assimilated, concentrated food. It should be remembered that when fat is barred from the diet, egg yolk should not be given.

Egg white is valuable chiefly as a source of protein. Because of its mild flavor it can be combined with many substances, especially milk and other beverages (See "Albuminous Beverages," page 118), to increase the nutritive value of a liquid or semi-solid diet.

With some persons, eggs induce constipation, or have a slight aphrodisiac effect. They contain sulphur, and unless digested before decomposition occurs in the alimentary tract,

give rise to hydrogen sulphide gas. They should not be eaten by those suffering from flatulent dyspepsia, gastric dilatation, or any severe gastric derangement. They are contraindicated in acute Bright's disease.

Principles to be Observed in Cooking. The principal constituent of the egg is albumin, which should be cooked in such a manner as to require the least possible expenditure of force in digestion. Those who are ill cannot afford to waste energy, and whether they are forced to do so or not depends much upon those who prepare their food.

Effect of Temperature on Albumin. See "Albumin," page 11.

The proper cooking temperature of egg albumin is 160 to 180 degree Fahrenheit, when it is found to be tender, soft, jelly-like, and in an easily digested state.

But cooked at the boiling point of water, 212 degrees Fahrenheit, albumin is found to be firm, compact, tough and indigestible. With this knowledge we can appreciate the necessity of cooking eggs at a temperature below that of boiling water. It is often advisable to cook the white and yolk of eggs separately, as the yolk when hard cooked (at proper temperature) and mealy is more easily digested than the soft cooked yolk, and the white more easily digested soft cooked.

Suggestions. Eggs should be kept in a cool, dry place. Always wash eggs just before using. Save the shell for making boiled coffee, as the shells of three eggs is as effective in settling coffee as one whole egg. When using several eggs break them separately in a saucer to test the quality of each.

In beating fresh eggs to a stiff froth the albumin entraps the air, forming bubbles which expand and stiffen when exposed to heat and blended with batter and dough, thus making the food light and spongy. Stale eggs lose this quality of frothiness.

Test for Fresh Eggs. (1) The shell of a fresh egg is slightly rough; held to the ear and shake slightly there should be little sound, held in front of electric light or candle in

a dark room if they look more transparent in center they are fresh, if more transparent at ends, are stale.

(2) In a solution made of two ounces of common salt and one pint of water, an egg one day old will sink (not quite reach the bottom); three days old will barely float above the surface, and seven days old will float above the surface. This is due to the loss of water and to the development of gases of putrefaction. Unless air is excluded from eggs they very quickly deteriorate in value and decompose.

The water in the egg evaporates through the shell, which is porous, and air rushes in to take its place, causing decomposition of the organic matter of the egg, the result being the formation of various gases — principally sulphuretted hydrogen, due to the action of putrefactive bacteria which enter the shell with air. Eggs eaten in this state may cause gastric and intestinal disorders, therefore, unless eggs are perfectly fresh, they should not be given to a child or a person of delicate digestion or the sick.

ENERGY VALUE OF AN EGG[1]

	Calories	Calories	Calories
I egg (without shell)	small 60	medium 73	large 80[2]
1 white of egg.......	13	18	30
1 yolk of egg........	48	55	50

See Table, page 64, for energy value of other ingredients.

SOFT COOKED EGGS

Wash one egg and put it in a small saucepan of boiling water to cover; remove to back of stove, or where the water will keep very hot, but not boil. Cook seven to ten minutes, according to consistency desired. Serve in slightly heated cups.

Note.— A stone crock is nice to use, as it keeps more even heat. A double boiler may be used, putting boiling water in top and bottom, set on back of stove and cook six to seven minutes, according to size of egg.

Care must be taken that the size of utensil is in accordance with the number of eggs to be cooked, so that the cold eggs

[1] Range from 60 to 100 calories according to size of egg.
[2] According to Dr. W. Coleman.

will lower the temperature of the boiling water. Keep temperature about 160 degree Fahrenheit, or a little above.

SOFT COOKED EGGS NO. II

Wash one egg and put it in a small saucepan of cold water to cover. Bring just to boiling point, remove and serve in slightly heated cups.

HARD COOKED EGGS

Follow directions for soft cooked eggs No. I, allowing egg to remain in water forty-five minutes. Chop fine and add one-half teaspoon butter and a few grains salt, serve in slightly heated cups.

STEAMED EGGS

Butter an egg shirrer or a small sauce-plate and pour in the eggs. Salt, place in steamer over boiling water, and cook till white is firm. Cooked in this manner, the white is tender and light and can be eaten by invalids.

BAKED EGGS

Plain baked eggs make a pretty breakfast dish. Take a deep earthen plate, butter it and break in the eggs, adding salt, pepper, bits of butter, and bake in a moderate oven until the white is set. Garnish with curled parsley and serve with buttered toast. Use a small dish to prepare one egg.

Note.— Before cooking ½ tablespoon of cream to each egg may be poured over them, and in serving a little grated cheese may be sifted over the top.

BAKED EGGS (FOR THE DIABETIC)

Break an egg into a baking-cup, pour gently over it a large tablespoonful of melted butter sauce; then add a thick layer of grated cheese; sprinkle with Gum Gluten cracker crumbs, and dot with bits of butter. Bake until the egg is set, and serve at once.

GOLDEN-ROD EGGS

1 hard-cooked egg = 60 Calories. 2 slices toast = 146 Calories.
Sauce = 170 Calories.

2 teaspoons butter.
½ tablespoon flour.
½ cup scalded milk.
Speck white pepper.
Salt.

Prepare the sauce. Add the white of egg chopped fine, pour over the toast and rub the yolk through a strainer over the top. Serve at once.

Sauce. Melt butter, add flour and gradually the scalded milk; cook well and season with salt and pepper.

EGG NESTS, 142 CALORIES

1 egg.
¼ teaspoon butter.
Salt to taste.
1 round of toast with toast points.

Toast bread. Separate egg. Beat white to a stiff froth. Salt to taste. Spread toast with butter and put white of egg on in shape of nest. Make a depression in center, put in the butter and drop the yolk in the hollow. Cook in a moderate oven three or four minutes.

Note.— May be cooked in tumbler placed in pan of water, allowing the water to heat gradually, and as the white rises, make a depression and drop in yolk.

It may be served with Tomato Sauce.

FOAMY OMELET, 144 CALORIES

1 egg.
1 tablespoon milk.
2 teaspoons butter.
½ saltspoon salt.
Speck pepper.

Separate egg and beat white to a stiff froth. Beat yolk till light, add milk, salt and pepper; lightly fold the yolk into the white. Put butter into sauté pan, when it bubbles pour in the mixture. Gently shake pan so omelet will not adhere to it; lift up at sides with a knife to see when done, and when a delicate brown set pan in oven a minute to absorb moisture on top. Fold omelet half over, turn on a hot dish, and serve immediately.

Variations. Mix one tablespoon ham, or any meat, chopped fine, with foamy omelet, and cook as directed. Or when omelet is cooked, the chopped meat may be spread over before folding. A little chopped parsley may be added. Oysters either whole or chopped, or creamed chicken, stewed or sliced tomatoes, asparagus tips, peas or jelly may be used.

BAKED MEAT OMELET

Prepare Foamy Omelet and add to it the chopped meat. Put it into a buttered pudding-dish, set it in a pan of hot water and bake until firm.

BREAD OMELET, 164 CALORIES

2 tablespoons bread crumbs.
2 tablespoons milk.
Speck salt.
Speck pepper.
1 egg.
1 teaspoon butter.

Soak bread crumbs in the cold milk for ten minutes, add the salt and pepper. Separate egg and beat until light. Add the crumbs and milk to the yolk and fold in the white. Follow general directions as for Foamy Omelet.

POACHED OR DROPPED EGGS

Toast a square or round piece of bread and four toast points; put on hot plate with points at each side and garnish with a sprig of parsley. Have a shallow pan two-thirds full of boiling salted water, allowing one teaspoon salt to one pint water. Put a slightly buttered muffin ring on a buttered skimmer in the water. Break an egg into the ring. The water should cover the egg. When there is a film on top and the white is firm, carefully take up skimmer, remove ring, loosen egg with a knife and place on the toast; salt slightly. The toast may be buttered if desired.

EGG POACHED IN MILK, 470 CALORIES

1 egg.
1½ teaspoons butter.
½ cup thin cream.
Salt.
2 tablespoons grated cheese.

Melt butter in top of double boiler, add cream and when hot drop in carefully the egg. Cook until white is nearly

firm, add salt and sprinkle with cheese. Serve on toast. Cheese may be omitted.

CODDLED OR SCRAMBLED EGGS, 180 CALORIES

1 egg.	1 saltspoon salt.
½ cup milk.	Speck pepper.
1 teaspoon butter.	

Beat egg in top of double boiler until light, add milk and rest of ingredients and stir over boiling water until it thickens; allow it to stand a few minutes without stirring, to set. Serve on toast or hot rice.

EGG SANDWICHES, 96 CALORIES

1 hard-cooked egg.	⅛ teaspoon mustard.
¼ teaspoon salt.	3 drops vinegar.
Speck paprika.	1 teaspoon butter.

Mince the egg very fine with a silver fork, add seasonings and butter, and mix thoroughly. Butter very thin slices of bread, spread with egg mixture, cover it with watercress leaves, or bits of nasturtium leaves, or lettuce. Cover with another slice of bread, and cut in triangles or rounds. Serve on small plate and doily.

Note.— Minced ham may be added to egg mixture.

SHIRRED EGGS

Butter an egg shirrer, ramikins, or small earthen cups; put one egg in each without breaking yolk; dust with salt and white pepper, put in pan of hot water and cook on back of range or in a moderate oven until white is set. If baked, cover with a buttered paper to keep from browning.

SHIRRED EGGS NO. II

Butter small, deep earthen dishes and line with fine white bread crumbs moistened to a paste, and seasoned with salt and pepper. Break an egg in each, sprinkle with a few grains of salt, cover with more paste and bake in a pan of hot water, placed in the oven. When egg is set, serve with two tablespoons of tomatoes or cream sauce poured over it, and garnish with a sprig of parsley.

FILLED EGGS, 96 CALORIES

1 hard-cooked egg.	⅛ teaspoon mustard.
1 teaspoon butter or	Paprika.
1 teaspoon olive oil.	Salt.

Remove the shell and cut the egg in halves lengthwise. Take out the yolk carefully without breaking the white. Rub the yolk to a smooth paste, adding the butter or oil and the seasonings, and mix thoroughly. A small quantity of finely chopped ham, tongue or chicken may be added. Fill the whites with the mixture and serve on lettuce, or in a bed of parsley.

EGG DESSERTS

See "Nutritious Desserts" for recipe. Page 286.

ALBUMINOUS BEVERAGES

See "Albuminous Beverages" for recipe. Page 118.

MILK AND MILK PRODUCTS[1]

Milk is the only substance in nature designed expressly for the nourishment of the young animal. It contains all the compounds necessary to support life, in remarkably good proportions and in very assimilable forms. It is a perfect food for infants, and is specially suited to the needs of certain classes of invalids and sedentary persons. For the active adult it is undesirable as the sole article of diet, because the proportion of water is so high that large quantities have to be taken to supply the necessary energy; because the proportion of protein is unnecessarily high; and because it furnishes no indigestible residues to supply bulk for the perfect functioning of the intestines.

Composition. Milk contains the five food principles, the proportions varying somewhat with different species, and also with individuals of the same species. Cow's milk, which is most extensively used, is the only kind which will be considered here. Milk has a specific gravity of 1.027 to 1.035.

[1] For further information, note "The Use of Milk as Food," Farmer's Bulletin No. 363, U. S. Dept. of Agriculture, Washington, D. C.

The chief bulk is water, which averages 87 per cent. The solid matter is made up of proteins, fats, carbohydrates and mineral matter. The average percentages are as follows: Protein, 3.3 per cent.; fat, 4 per cent.; carbohydrates, 5 per cent; mineral matter, 0.7 per cent.

The principal protein is casein, a compound containing both phosphorus and sulphur. Casein is precipitated (or coagulated) by the addition of acid or in neutral solutions, by rennet. Milk also contains lactalbumin, arranging about 1/7 of the total protein. The character of the curd depends largely on the relative proportions of casein and lactalbumin.

The fat of milk varies widely in amount. It is found throughout the milk in globules, i. e., as an emulsion. On standing, the fat rises to the top and forms cream chemically, Several fats are present, chiefly stearin, palmitin and olein, with smaller amounts of others, which give the characteristic flavor to butter. The chief carbohydrate is lactose or milk sugar. This remains in the whey when the casein and fat are removed.

The ash constituents are mainly phosphates and chlorides of calcium, sodium and potassium.

Digestibility. While milk is taken as a liquid, it should really be regarded as a solid food, for in the stomach it is coagulated by the aetion of the enzyme rennin in the gastric juice. If the milk is swallowed hastily, a large, tenacious curd may form, which will remain long in the stomach, and the milk will be regarded as difficult of digestion. If the milk is sipped slowly — or eaten with a spoon — the curds will be small, and hence readily acted on by the gastric juice. For this reason, the combination of milk with another food material, as bread or cereal gruel, may render it more easily digestible. Many persons think that they cannot digest milk. This is seldom true, if the above precautions are taken.

Nutritive Value. Milk is a high protein food. In infancy it therefore furnishes the nitrogen necessary for the formation of new protoplasm. Throughout the growing period, it furnishes the most valuable source of protein, as it is non-

stimulating, and less liable to putrefaction in the alimentary tract than meat proteins. Given a quart of milk and an egg each day, a child under eight years of age on a suitable diet of proper fuel value, will have sufficient protein for all body needs.

The fat of milk, being in an emulsified form, is more readily digested than the fat of meats and other similar foods. The carbohydrates of milk require only transformation to simple sugars by the intestinal enzyme lactase, to be perfectly utilized. Often the energy value of milk is increased for infants and invalids, by addition of this soluble, mild-flavored compound.

The ash of milk contains the elements required for the bony tissues in particularly assimilable forms. It is lacking in iron, so that this element must be supplied by other foods (as yolk of egg) when milk is the chief source of nutriment.

The value of milk as a food is not appreciated by many people. It is frequently regarded as a beverage rather than nutriment, while in fact a quart of milk is equivalent in food value to half a loaf of bread (six ounces) or three-quarters of a pound of lean beef. It contains as much protein as one-third of a pound of lean beef, at approximately the same price, and in addition about as much fat as is daily consumed at the table in the form of butter, over one and one-half ounces of milk sugar, and valuable mineral salts. Compared with other animal foods milk is a cheap food, even at 10 or 12 cents per quart, and should enter freely into the dietary. It need not be used as a beverage if disliked, but can be combined with other materials in soups, sauces for vegetable, custards and the like, or used in cooking cereals, in place of water.

The value of skim milk as a food also needs to be emphasized. It has lost most of the fat in the skimming processes, but is correspondingly richer than whole milk in protein, carbohydrates and ash. It is not as rich in flavor as whole milk, but used in combination with other foods it forms a very inexpensive source of valuable nutriment, two and one-

half quarts of skim milk will yield as much protein as a pound of lean round steak, at less than one-fourth the cost.

Care of milk. The importance of keeping milk clean cannot be over-emphasized. Aside from all esthetic considerations, absolute cleanliness is essential as a protection to health. Milk is an excellent culture medium for bacteria, and these organisms may not only be of types producing changes in the character of the milk, such as alterations in flavor, odor, color, decomposition of proteins, formation of gases, alcohol, lactic acid, etc., but also disease germs, especially those of tuberculosis, scarlet fever, typhoid fever, and diphtheria.

Commercially, care of milk is important as effecting the keeping qualities. For all these reasons, milk should come from a healthy animal in a sanitary environment. Milking must be done under conditions which protect the milk as fully as possible from contamination through impurities on the cow herself, on the hands or clothing of the milker, in the receptacles used for the milk, and in the air, in the place where the milking is done. Milk should be immediately cooled, and transported to the consumer in sealed bottles; cooling prevents the growth of bacteria. Such cautions necessarily increase the price of milk, but even then milk is a cheap food and the additional security is worth paying for.

Certification of Milk. To insure a milk free from impurities, the method of certification and pasteurization have been widely adopted.

Certification involves a specific testing of milk against all accidental and harmful contamination. To secure it the services of chemists, bacteriologists and veterinary surgeons are required. The most vital object desired is the exclusion of tubercule bacilli from milk, which involves a special inspection of dairy herds and rejection of tuberculous cows. Other pernicious germs, pus corpuscles, etc., are also sought for.

Certification of milk requires periodical inspection of

dairies, of bottled milk bought in open market, etc. All milk must correspond to a number and variety of tests, too numerous to be mentioned in this connection. Every branch of the milk trade is covered. Such milk receives a certificate which should contain the date of milking and is naturally expensive, but it should be used whenever possible for infants and little children, and for all purposes in households which buy the best grades of other food materials.

Pasteurization. This is the process by which milk is rendered more or less sterile through destruction of active bacteria by heat. Various standards as to temperature and time have been adopted, but in general the milk is heated to a temperature not exceeding 145° F., for a period of 20 to 30 minutes, and then rapidly cooled to 45° F. or lower. Most harmful bacteria and lactic acid bacteria are killed. Spores are not killed, and if the milk is not kept cold or is allowed to stand too long, putrefactive organisms develop. These putrefactive changes are very undesirable, so that the care of pasteurized milk is just as important as that of fresh milk. If carelessly handled, the fact that it does not sour readily is a menace to health rather than a benefit.

Commercial pasteurization is a cheap and effective means of preventing the spread of ordinary infectious diseases. The degree of heat specified does not change materially the flavor nor the chemical composition of the milk. It does destroy the enzymes naturally present in milk, and how much this affects the value of milk for infants is still unsettled. When clean fresh milk cannot be absolutely insured, it is safer to pasteurize. But this process cannot make bad milk good nor dirty milk clean. If bacteria have already produced poisonous products it will not destroy them.

Sterilization. Sterilization is accomplished by keeping milk at boiling temperature (212° F.) for 10 or more minutes, preferably in the vessel in which it is to remain. This will kill all living bacteria, but will not destroy spores. Hence to render milk absolutely sterile, repetition of the process on successive days is necessary. This is rarely done, as the

spores are not likely to develop if the milk is kept at a temperature of 40° F. or less.

Sterilized milk is not an ideal food. Boiling changes the taste, and the cream does not rise as quickly; Lecithin is decomposed, diminishing the amount of organic phosphorus compounds, and increasing the inorganic phosphorus which is not generally considered as useful to the body. It is less easily coagulated by the action of rennet, since the calcium salts are changed. The ferments of the milk are also destroyed. Sterilization should be regarded as an emergency measure, for hot weather, when cooling facilities are lacking.

MILK PRODUCTS

Butter. Butter consists almost entirely of separated milk fat. Churning causes the fat globules to unite into a solid mass. The cream is first allowed to ripen for some hours. This process gives the characteristic taste and odor, which is due to action of bacteria. When kept, butter tends to turn rancid, owing to the fermentation of a small quantity of casein present. Salt is added largely to prevent this change. Butter is very palatable, and one of the most digestible forms of fat.

Cheese. Cheese is made from full milk, skim milk or cream. It consists of the casein of the milk and more or less of the fat and mineral matters. The flavor is due to the action of enzymes in molds or bacteria. Cheese is a very concentrated nutritious food, and very thoroughly assimilated. It is not usually well borne by invalids and convalescents, however.

Cream. Cream is the fatty layer which forms at the top of milk which is allowed to stand undisturbed. It contains the fat of the milk, water, some protein, carbohydrates and mineral matter. The percentage of fat is exceedingly variable, ranging from about 16 per cent. to 40 per cent. The cream which rises on milk after 24 hours is called gravity cream and contains about 16 per cent. fat. The richer creams are obtained by centrifugalizing the milk. Cream in large

quantities is less easily digested than an equal amount of whole milk because of the large amount of fat, but this form of fat is easily digested compared with other food fats, and hence is often ordered by physicians.

Curds. When milk sours, owing to the formation of lactic acid by the action of lactic acid bacteria upon the sugar, or when the enzyme rennet is added to fresh milk at body temperature, and the clot is stirred, the curds separate from the whey.

Curds consist of coagulated casein, which commonly carries with it the fat; gentle heat facilities this separation, but a high temperature renders the curd tough and indigestible; with or without the addition of cream, curds are used as cottage cheese. It is a very cheap, nutritious food.

Junket. If sweet milk is allowed to stand undisturbed after the addition of rennet, the thickened, custard-like mass is called junket. This is a valuable method of using milk, especially for invalids, children, and those who from personal idiosyncrasy cannot drink milk.

Whey. This substance may be either sweet when formed by junket or sour when otherwise produced. It contains most of the lactose, lactalbumin and ash constituents of the milk, but has so little nutritive value, owing to the removal of the milk fat and casein, that it may be regarded as a beverage. See page 185.

Sour Milk. When whole milk sours, with the formation of "curds and whey," the entire product is known as clabber or bonny-clabber. It is wholesome, and nutritious, since it contains all the ingredients naturally present in milk. By some it is used as a beverage. When not so relished, it can be used to good advantage in cooking, adding its nutritive value to any dish in which it is incorporated.

Buttermilk. True buttermilk, which is common on farms, is seldom found in commerce. Unless produced where sold, its genuineness may be a matter of question. Those who are familiar with the genuine article state that the delicacy of its flavor, its consistency, etc., are much superior to the so-

called buttermilk of commerce. The composition of the two articles is practically the same. When skim milk, the cream having been removed by the separator, is allowed to sour, it is said to resemble ordinary buttermilk, and the fluid which goes by the latter name, sold extensively throughout Greater New York, is said to be sour skim milk.

Metschnickoff Artificially Soured Milk. The announcement some years ago by Metschnickoff that the foregoing products were of very great hygienic and therapeutic value in disinfecting the intestines has resulted in the wholesale production of a substance which differs from ordinary sour milk in that it is prepared from a pure culture of lactic-acid germs. This product is doubtless destined to replace the older ones on account of its freedom from undesirable forms of bacteria. The technique for preparing it, devised originally by Metschnickoff himself, also places it in a higher class than the older preparations. The pure culture is sold in the solid form as Buttermilk Tablets.

Fermented Milk. Milk which has been fermented is really a derivative of native milk, and in parts of Europe and Asia constitutes an important article of diet. The fermentation is either the lactic alone or lactic and alcoholic together.

The ferments used consist chiefly of various "leavens" or cultures which cause lactic acid fermentation. People who have subsisted on this milk for centuries simply use a portion of old fermented milk to leaven fresh milk. These leavens vary considerably in composition, and the milk used may be from one of several domestic animals. Some leavens contain yeast germs, as that alcohol may or may not be present. The native preparations which have been imitated in this country are kumyss, kefir and matzoon.

Kumyss was prepared originally from mares' milk. The leaven contains lactic acid germs and yeast. The product therefore contains lactic acid, alcohol, and carbonic acid gas, representing an acid, effervescing, mildly alcoholic beverage. The casein curd is finely broken up and partially digested. Kumyss has been imitated in America by adding

yeast to milk and allowing fermentation to proceed twenty-four hours or over.

Kefir was made originally from cows' milk with a leaven of kumyss. This has been sold in tablet form like the rennet ferment. Kefir resembles kumyss so closely that no further description is necessary.

Matzoon differs from the preceding chiefly in containing no alcohol.

Modified Milk is milk containing definite proportions of fat, sugar, proteids, etc., put up usually according to the formula of a physician, who prescribes the quantity of the different constituents he desires.

For sick children and in convalescence it is of great value to obtain a modification in which the composition is definite and accurate. It can then be known what mixtures will agree with the patient.

Malted Milk is a pure food prepared from rich full-cream milk, combined with the valuable nutritive extracts of malted barley and wheat. This product being highly concentrated and partially predigested, supplies a large amount of nutrition with little tax upon the digestive organs. It is a valuable nutrient in dyspepsia or impaired digestion, for fever and wasting diseases, the convalescent, nursing mothers, and the aged.

Peptonised Milk is milk in which the casein or curd has been made soluble and diffusible by means of the Peptonising Tubes. In these Peptonising Tubes, extractum pancreatis, containing the pancreatic ferment which acts especially upon the proteins of milk, is combined with soda bicarbonate in due proportion, and each tube contains sufficient peptonising powder to peptonise a pint of milk. Milk may be peptonised by various methods — by the "cold process," "immediate process," "warm process," etc. The method and degree of peptonisation suitable for any special case is soon determined by experience, by the agreeability of the milk and its digestibility.

Condensed Milk. Preservation of milk by condensation

constitutes a very extensive commercial industry. There are several processes in vogue, and the product is either sweetened or unsweetened. Ordinary unsweetened milk contains about 12 per cent. each of protein and fat and 16 per cent. of the native milk sugar, making the total solids 40 per cent. Cane sugar may be added to the amount of about 40 per cent. more, making the total solids 80 per cent. Milk may also be condensed by forcing filtered air through it, until its volume is reduced to one-fourth the original amount. This product is sold in sterile bottles. Condensed milk is very generally used as a substitute for fresh milk. It is especially valuable in tropical regions and on ocean voyages. It is important that condensed milk be made from clean milk, and kept free from bacteria contamination. The unsweetened brands are especially liable to putrefaction, and should be cared for, when opened, like fresh milk.

Evaporated Milk is made of pure milk, fresh from the cow, nothing taken from it to lessen its nourishing qualities and nothing added. It is sterilized by the application of a higher degree of heat than is used in ordinary pasteurization.

ENERGY VALUE OF MILK

1 cup of whole milk..................	=169 Calories.
1 cup skimmed milk	= 89 Calories.
1 cup cream (18%)	=440 Calories.
1 cup cream (40%)	=864 Calories.

PASTEURIZATION

Methods of Preparing. Put bottle into kettle of cold water and slowly bring to the boiling point. Boil ten minutes. After which fill immediately nearly full with milk; cork with absorbent cotton which has been baked in the oven until a delicate brown. Place bottles on a rest in a deep pan so that they will not touch bottom, and fill the pan with cold water to reach as high as the milk in bottles. Heat water gradually to 145 degrees Fahrenheit, or until small bubbles appear in the milk next to the glass. Remove to back of stove and keep milk at same temperature 20 to 30 minutes; then cool

quickly to 45 degrees or lower. To cool rapidly put bottles first into lukewarm water and then cold water until milk is cold, then surround with ice water. Keep in cold place and do not remove stoppers until ready to use. Note Pasteurization, page 188.

Utensils. A convenient form of apparatus for pasteurization can be purchased or a covered tin pail answers well for the larger vessel, and an inverted pie pan with perforated bottom can serve as the false bottom. A hole may be punched in the cover of the pail, a cork inserted and a chemical thermometer put through the cork so that the bulb dips in the water, thus enabling one to watch the temperature closely without removing the cover, or an ordinary dairy thermometer may be used from time to time by removing the lid.

STERILIZATION

The utensils and methods to sterilize milk are the same as for pasteurizing, except that the water is heated to the boiling point (212° F.) and the time for boiling is ten or more minutes. Note Sterilization, page 188.

EVAPORATED MILK

It is sometimes of advantage, as in cases of dilated stomach or whenever the total amount of fluids must be cut down to a given point, to heat the milk in a pan over which is placed an inverted funnel. Much of the water of the milk passes off as vapor, while the solids remain in the pan.

BAKED MILK

Into a stone jar put one-half gallon of sweet milk; cover with writing paper and tie it on. Bake in moderate oven nine to ten hours. It will be the consistency of thick cream.

MALTED MILK, 59 CALORIES

Mix one tablespoon of Horlick's Malted Milk powder with a little tepid water to make a smooth paste; add three-fourths cup water, hot or cold, stirring briskly and serve.

Note.— May be prepared with hot milk instead of water and a little cream added if desired.

PEPTONISED MILK, 338 CALORIES

Warm Process

Put one-half cup (gill) of cold water and the powder contained in one of the Peptonising Tubes (Fairchild) into a clean quart bottle and shake thoroughly; add a pint of cold fresh milk and shake again; then place the bottle in a pail or kettle of warm water — about 115° F., or not too hot to immerse the whole hand in it without discomfort. Keep the bottle in the water bath for five or ten minutes, or longer if it is desired to peptonise the milk quite completely, then put it *immediately* on ice — directly in contact with the ice — in order to check the process of digestion and keep the milk from spoiling.

The degree of peptonisation is very simply regulated in this process by the length of time during which the milk is kept in the water bath. *It is seldom necessary to peptonise milk until it becomes bitter.*

PARTIALLY PEPTONISED MILK, 338 CALORIES

Put one-half cup (gill) of cold water and the powder contained in one of the Peptonising Tubes (Fairchild) into a clean saucepan, and stir well; add a pint of cold fresh milk, and heat, with constant stirring, to boiling point. The heat should be so applied that the milk will come to a boil in ten minutes. Let it cool to about lukewarm, then strain into a clean bottle or glass jar, cork tightly and keep in a cold place. The bottle or jar should always be well shaken before and after pouring out a portion. The milk may be taken cold or hot as the physician may direct.

"Partially peptonised milk" if properly prepared will not become bitter.

PEPTONISED MILK, 338 CALORIES

Cold Process

Put one-half cup (gill) of cold water into a clean quart bottle and dissolve in it by shaking thoroughly the powder

contained in one of the Peptonising Tubes (Fairchild); add a pint of cold fresh milk, shake the bottle again, and *immediately* place it on ice — directly in contact with the ice.

The bottle should always be well shaken before and after pouring out a portion.

Peptonised milk prepared by this recipe is especially appreciated by patients who dislike the taste of warmed or boiled milk, and ordinarily it is readily digested and assimilated.

PEPTONISED MILK

Immediate Process

Put two tablespoons (1 oz.) of cold water into a goblet or glass; dissolve in this one-quarter of the contents of a Peptonising Tube (Fairchild); add eight tablespoonfuls (4 ozs.) of warm milk — not boiling; drink immediately, sipping slowly; 85 calories.

To prepare half a pint of milk, use half the contents of a Peptonising Tube, 4 tablespoonfuls of water, a half pint of milk; 169 calories.

SPECIALLY PEPTONISED MILK, 338 CALORIES

For Making Milk Jelly, Milk Punch, Milk Lemonade, and for Use with Fruit Juices or Acids

Peptonise a pint of milk by the "Warm Process," keeping the bottle in the water bath for *one hour;* pour the peptonised milk into a saucepan and *heat to boiling,* when it is ready for use if it is required hot; or it may be put on ice, in a bottle or any suitable container, to be used for punches, lemonade, etc.

It is necessary to peptonise the milk quite completely — for one hour — so that it will not curdle when mixed with lemon juice or acid. The bitter taste of this "specially peptonised milk" is not evident in the jellies, punches, etc., and these foods are very agreeable and exceedingly assimilable.

EFFERVESCENT PEPTONISED MILK

Into a glass put some finely cracked ice and fill it half-full of vichy, White Rock or siphon water, add immediately

peptonised milk prepared by any of the prescribed methods and drink while effervescing. Brandy or other spirits may be added if desired.

THICKENED MILK

See Flour Gruel. Page 239.

RICE MILK, 458 CALORIES

1 ounce rice.
1 pint scalded milk.
1 saltspoon salt.
1 teaspoon sugar.

Soak rice twelve hours, strain and add the scalded milk, salt and sugar. Stir well and cook slowly one hour. Rub through a fine sieve (thin with more hot milk if desired). Taste and add more seasoning if necessary. Sago or tapioca may be used in the same way.

RUM AND MILK, 186 CALORIES

¾ cup milk.
¾ tablespoon rum or brandy.
1½ teaspoon sugar.

Use fresh or pasteurized milk. Put ingredients into a lemonade shaker or fruit jar (using rubber band and cover); cover well and shake until frothy. Serve in glass three-fourths filled.

SHERRY OR BRANDY AND MILK, 173 CALORIES

¾ cup fresh milk.
¾ tablespoon brandy or
⅓ wineglass of sherry.
¾ teaspoon sugar.
Nutmeg.

Blend as for "Rum and Milk." Fill glass three-fourths full and add a grating of nutmeg on top.

CINNAMON AND MILK, 132 CALORIES[1]

¾ cup new milk.
Stick cinnamon.
Sugar.
⅓ teaspoon brandy.

Boil milk, with sufficient cinnamon to flavor pleasantly, and sweeten. This may be taken cold with the brandy. Very good in cases of diarrhœa. Children may take it warm without brandy.

[1] Without sugar.

WHEY

$6\frac{1}{2}$ ounces whey = 50 Calories.

1 cup fresh milk.
1 teaspoon cold water.
$\frac{1}{4}$ Hansen's Junket Tablet.

Heat the milk until lukewarm; add the tablet, dissolved in the cold water. Allow it to jelly in a warm place. Then break up the curd and strain through two thicknesses of cheese-cloth, being careful to remove all the casein. Serve cold, with or without sweetening, and flavor as desired.

LIQUID PEPTONOIDS AND WHEY

Place one tablespoonful of finely cracked ice in a small teacup. Pour over it one tablespoonful of Liquid Peptonoids; stir, fill the cup with whey and drink slowly.

ACID PHOSPHATE WHEY

See "Acid Beverages" for recipe. Page 113.

LEMON WHEY

See "Acid Beverages" for recipe. Page 113.

WINE WHEY

See "Acid Beverages" for recipe. Page 113.

PANOPEPTON WITH WHEY

Put into a small teacup one or two teaspoonfuls of clean crushed ice; add one tablespoonful of Panopepton, stir, then fill the cup with whey. Drink slowly. This is very refreshing and nourishing — an admirable liquid food for fever patients and convalescents.

KUMYSS, 328 CALORIES

$\frac{1}{3}$ cake Fleischmann's yeast.
1 tablespoon water.
$1\frac{1}{2}$ tablespoons sugar.
1 quart milk.

Make a thin syrup of the sugar and water and cook one minute. Soften the yeast in two tablespoons of lukewarm milk. Heat the milk until lukewarm, add other ingredients and shake. Put in sterile patent beer bottles, place in upright position for twelve hours, at 70 degrees Fahrenheit (or comfortably warm room); then turn on side at heat

50 degrees Fahrenheit (lower part of ice-box). Ready for use after the first twenty-four hours; often kept several days, but the longer it is kept the less palatable it is. Do not open a bottle of kumyss without a champagne tap, or the cork may be punctured with a stout needle to let the gas escape. It should look like thick, foamy cream.

Kumyss is especially suited for many forms of indigestion, nausea, fever and gastric trouble, pulmonary consumption and other wasting disease.

Dr. Brush's prepared kumyss is recommended on account of its superiority over the home-made preparations, as the milk supply is controlled, and the method of preparing is carried out upon scientific bases. It is also more convenient, as it is ready for immediate use.

MATZOON OR ZOOLAK (GERMAN HOSPITAL, NEW YORK CITY)

1 pint = 338 Calories.

Take forty-five pints of milk, boil thoroughly. Cream two or three times; that is, until all the cream is removed. When the milk is still quite warm add two (2) bottles of prepared bottled Zoolak. Mix thoroughly. Bottle quickly in pint bottles, not entirely full. Cork tightly immediately, and put in a warm place till the liquid shows creamy through the bottles. Then place and keep in a cold place.

N. B.— If chilled before it is thick it remains thin and the flavor is spoiled. If not kept very cold after it is made the fermentation is carried too far.

JUNKET, 169 CALORIES

1 cup fresh milk.
1 teaspoon cold water.
¼ Hansen's Junket Tablet.

Heat the milk until lukewarm; add the tablet dissolved in the cold water; allow it to jelly in a warm place; chill in ice-box; serve plain or in the various ways as directed in chapter "Nutritious Desserts."

ARTIFICIAL OR HOMEMADE BUTTERMILK

1 cup (whole milk buttermilk) = 169 Calories.

Pasteurize fresh, sweet milk, which may be new, or partly

skimmed, or entirely fat-free, as desired, by heating it to between 160 and 175 degrees F, and holding at such temperature for at least 20 minutes, cool to 100 degrees.

Dissolve one Junket Brand Buttermilk Tablet in a tablespoon of cold milk or water and add a quart or less of the pasteurized milk. Leave in warm room until thick, 24 to 36 hours.

When milk has thickened, place in refrigerator. When cold, " Churn " by shaking the bottle vigorously for a minute or two. Or the milk may be prepared in a fruit jar, a bowl or a pitcher and beaten with an egg beater until smooth and creamy.

If the acid flavor is too mild, let stand cold another day.

If desired, the milk may be diluted with one-fourth water. A pinch of salt may be added.

Junket Buttermilk may be kept on ice or in refrigerator for a week or longer.

SWEETBREADS

Among epicures sweetbreads are considered a dainty and are certainly a most acceptable food for the sick, as they are easily digested, but they must not be used to excess on account of the large amount of uric acid which they produce.

Definition. Sweetbreads are the pancreas and thymus glands of the calf, the word being used for either one or both organs. The thymus glands are removed and used for food while the animal lives on milk. The pancreas of the calf is sometimes called stomach sweetbread, and the thymus gland the neck or throat sweetbread. The latter is considered somewhat more easily digested than the former.

Digestibility. It is an error to state that sweetbreads are more digestible because they contain digestive ferments in life, for these are destroyed by cooking. The tenderness of these bodies is due doubtless to the delicate character of the connective tissue, and to the soft character of the gland tissue itself, which is rich in nucleo-protein. The presence of

this nuclein is objectionable for gouty and other patients with uric acid disorders, but this is no contraindication for an occasional use of them by invalids.

ENERGY VALUE OF SWEETBREADS

100 grams (3½ oz.) sweetbreads......... = 176 Calories.
1 pair sweetbreads, medium size (8 oz.) .. = 399 Calories.

1 pair sweetbreads, medium size (8 oz.), when cooked, freed from membrane, pipe, etc., and cut into cubes, measures three-fourths cup.

TO PREPARE SWEETBREADS

(To Parboil.)

Remove from paper as soon as received from market, plunge into cold water and allow to stand one hour. Drain. Place immediately in boiling water salted water to cover, allowing one-half tablespoon each of salt and vinegar to a pair of sweetbreads. Simmer twenty minutes; again drain and plunge into cold water that they may keep white and firm. Free from membrane fat and veins, and serve as desired.

Sweetbreads are always prepared in this way for subsequent cooking and are spoken of as parboiled.

BROILED SWEETBREADS

Parboil and cut in halves cross-wise. Sprinkle with salt and pepper, place on a greased fine wire broiler, and broil five minutes over a clear fire. As soon as sweetbread is heated brush both sides with a little melted butter. Serve with creamed butter to which has been added a little lemon juice or simply spread with soft butter.

CREAMED SWEETBREADS NO. I, 288 CALORIES

(Individual Rule.)

½ tablespoon butter.	¼ cup milk.
½ tablespoon flour.	⅓ cup sweetbreads.

Melt the butter, add flour and pour on gradually the scalding milk. Cook thoroughly and season. Add the parboiled sweetbreads cut in small pieces, reheat and serve on toast and garnish with parsley.

Note.— For Scalloped Sweetbreads put creamed sweetbreads in small baking dish; cover with cracker crumbs and dot with bits of butter; bake until crumbs are a golden brown.

CREAMED SWEETBREADS NO. II, 968 CALORIES

(Three Servings.)

1 cup thin cream or rich milk.
2 teaspoons butter.
2 tablespoons flour.
½ teaspoon salt.
¾ cup sweetbreads.

Parboil sweetbreads and cut into one-half inch cubes. Blend flour with a little cold milk to make a smooth mixture; scald cream in double boiler, add the flour mixture and cook thoroughly. Just before serving add the prepared sweetbreads, salt and butter. Serve hot on toasted rounds, and garnish with parsley, or use as a filling for Swedish timbales.

Note.— May use equal proportions of cold cooked chicken and sweetbreads, reheat and serve in the cream sauce.

FRICASSEED SWEETBREADS, 240 CALORIES [1]

(Three Servings.)

Parboil and cut sweetbread into one-half inch pieces. Make a sauce using:

2 teaspoons butter.
1 teaspoon flour.
½ teaspoon lemon juice.
¾ cup hot strong chicken broth.
¼ cup cream.
Salt and pepper.

Melt the butter, add the flour, allow it to simmer until a golden brown, then add the hot broth gradually, stirring constantly, lastly the cream. Season with salt, pepper and lemon juice. A speck of curry powder may be added if desired.

Put the cut sweetbread into the sauce, simmer five minutes and serve on sippets or squares of dry toast; garnish with parsley.

SWEETBREADS WITH PEAS

1 cup of canned peas = 100 Calories.

Parboil and broil sweetbreads, arrange in center of platter, and serve the peas (cooked and seasoned) around them.

[1] Calculated without the sweetbreads.

Or the peas may be piled in center of platter and the broiled sweetbreads arranged as a border. A cream sauce may be poured over all; for it, use the recipe in Creamed Sweetbreads No. I or II.

GELATIN

Source. Gelatin is a nitrogenous food classed with proteins, under the division called gelatinoids or albuminoids, and derived from "collagen," the chief constituent of connective tissue with its various modifications, as tendons, "chondrigen" of cartilage, or the "ossein" of bone. "By proper treatment, any form of connective tissue can be made to yield gelatin. Hide clippings yield glue, a crude form of gelatin, and much commercial gelatin is simply a purified glue, derived from such a source. Isinglass, obtained from the swimming bladder of the sturgeon and other fish, is the purest form of gelatin; the gelatin obtained from calves' feet is also of high quality."[1]

General Principles in Cooking. Gelatin is insoluble in cold water, but when allowed to stand in it will swell from absorption of water. "Gelatin is very soluble in boiling water, and on cooling sets into a jelly. This jellying will occur in a solution containing as little as 1 per cent. of gelatin."[1] Gelatin is decomposed by boiling and consequently if allowed to boil will not solidify on cooling.

Digestibility. Gelatin is very easily digested in the stomach, and readily absorbed from the small intestines.

Nutritive Value. Although gelatin is a protein food, it cannot alone support life. Proteins are made up of groups of amino acids, most of which it seems necessary to have represented in the diet, to secure complete repair of the waste of nitrogenous tissue. In gelatin two important acids are lacking; hence not more than two-thirds of the day's nitrogen requirement should be given in the form of gelatin. Because

[1] State of Connecticut. Report of The Connecticut Agricultural Experiment Station. Food and Drug Products, 1909. Being Part II of the Biennial Report of 1909–1910.

it can to this extent take the place of other proteins, gelatin has often been called a "protein-sparer," rather than a true protein. In the ordinary intake of animal food, not more than one-eighth of the total nitrogen is in the form of gelatin. It is usually not convenient to take more than 25 to 30 grams (about 1 ounce) in a day. Six ounces of calf's foot jelly (which would be a large helping) contain less than half an ounce of gelatin. Jellying will occur in a solution containing as little as 1 per cent. of gelatin. Gelatin has the advantage (along with other proteins) of fixing a good deal of acid in the process of stomach digestion and is thus of service in cases of hyperacidity of the stomach, when given in other forms than *acid* jellies. It seems also to promote the secretion of gastric juice. It is useful in febrile states as it really belongs with liquid foods, melting as it does at body temperature.

In convalescence, acid jellies (orange, lemon, etc.,) are of service as a pleasant supplement to the ordinary diet, but the actual nutriment which they supply is small.

Extra nutriment can be added to gelatin by combining it with eggs and milk, as in Snow Pudding, Charlottes of various kinds, Spanish Cream, etc., all of which are attractive forms of invalid diet.

Meat Jellies are condensed form of broth, and are prepared by taking any meat containing a large proportion of connective tissues and cooking long and slowly. (Note broths, page 217 for directions and recipes.) Home-made jellies, properly prepared, have a pleasing flavor and are an agreeable addition to diet of an invalid, although their nutritive value is low.

WINE JELLY NO. I, 165 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
¼ cup boiling water.
2 tablespoons sugar.
2 tablespoons wine.
1 tablespoon orange juice.
1 teaspoon lemon juice.

Soak gelatin in the cold water 5 minutes; add the boiling water and dissolve. Add sugar, wine, orange and lemon juice. When sugar is dissolved, strain through a cheesecloth into cold, wet molds; or chill in shallow soup plate and when firm cut into one-half inch cubes and serve in sherbert or champagne glasses, or half orange shell with a little whipped cream on top.

WINE JELLY NO. II, 1530 CALORIES

(Six Servings.)

½ box shredded gelatin or	2 cups boiling water.
2 tablespoons granulated gelatin.	1 cup wine.
½ cup cold water.	Speck salt.
1½ cups sugar.	

Cover gelatin with the cold water and let it stand about one-half hour. Add the boiling water, sugar and salt. Stir till gelatin is dissolved and add the wine. Strain through cloth and strainer into cold, wet molds and set in cold place to harden. Serve plain or with whipped cream.

PEPTONOIDS WINE JELLY, 192 CALORIES

¼ box gelatin.	2 tablespoons sugar.
4 tablespoons cold water.	1 tablespoon sherry wine.
8 tablespoons boiling water.	1 tablespoon Liquid Peptonoids.

Soak gelatin in the cold water 5 minutes; add the boiling water, sugar, wine and Liquid Peptonoids. When sugar is dissolved, strain and pour into cold, wet molds. Put on ice to harden.

ORANGE JELLY NO. I, 1020 CALORIES

(Six Servings.)

½ box shredded gelatin or	1 cup sugar.
2 tablespoons granulated gelatin.	1 cup orange juice.
½ cup cold water.	Juice 1 lemon.
2 cups boiling water.	

Soak the gelatin in the cold water one-half hour; add the boiling water and dissolve. Add sugar and fruit juice, strain through a cloth and strainer into cold, wet molds

and set away to harden. Serve plain or with whipped cream.

ORANGE JELLY NO. II, 152 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.	3 tablespoons orange juice.
1 tablespoon cold water.	2 teaspoons lemon juice.
1 tablespoon boiling water.	2 tablespoons sugar.

Make same as preceding. Soaking gelatin five minutes.

Cut orange in half, crosswise, remove pulp with spoon and strain through cheese-cloth. Fill halves with jelly; when it is hardened cut with sharp knife into thirds (which leaves the rim filled with jelly). Serve three pieces on small plate with whipped cream in center.

ORANGE BASKETS

Wash oranges. Remove two sections from the upper half of an orange, leaving a band of peel for a handle. Dig out the pulp and scrape clean. Fill with lemon or orange jelly, cut into cubes. An attractive form to serve to children.

Note.— If these shells are wrapped in a damp cloth they will retain their shape for hours.

LEMON JELLY, 142 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.	2 tablespoons lemon juice.
1 tablespoon cold water.	2 tablespoons sugar.
¼ cup boiling water.	

Soak gelatin in the cold water 5 minutes; add the boiling water, sugar and fruit juice. When the sugar is dissolved, pour into cold, wet molds and put on ice to harden.

GRAPE JELLY, 588 CALORIES

(Individual Rule.)

1 tablespoon granulated gelatin.	½ cup sugar.
¼ cup cold water.	Juice 1 lemon.
1 cup boiling water.	½ cup grape juice.

Soak gelatin in the cold water; add boiling water and dissolve. Add sugar, lemon juice and grape juice; strain, pour into cold, wet molds and cool.

This recipe may be served in another and very inviting form; when the gelatin is firm, force it through a potato ricer. Keep on ice until ready to serve.

PEACH JELLY, 130 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 teaspoon cold water.
1 tablespoon boiling water.
3 tablespoons peach juice.
1 teaspoon lemon juice.
1 tablespoon sherry wine.
1½ tablespoons sugar.

Soak gelatin in the cold water 5 minutes; add boiling water and dissolve. Add fruit juice, wine and sugar, strain and pour into a cold, wet mold.

COFFEE JELLY, 529 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
2 tablespoons strong hot coffee.
2 tablespoons sugar.
7 tablespoons cream.

Soak gelatin in the cold water 5 minutes. Add the hot coffee and dissolve; add sugar and strain. Set bowl into chopped ice, or ice water to cool, stirring occasionally until it thickens. Then add the cream, and pour into cold, wet molds to chill.

PEPTONOIDS COFFEE JELLY, 255 CALORIES [1]

¼ box granulated gelatin.
4 tablespoons cold water.
8 tablespoons boiling coffee.
Sugar to taste.
8 tablespoons Liquid Peptonoids.

Soak gelatin in the cold water 5 minutes; add the boiling coffee, sugar and Liquid Peptonoids. When sugar is dissolved, strain and pour into cold, wet molds. Put on ice to harden.

CREAM JELLY, 330 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
3 tablespoons scalded milk.
4 tablespoons thick cream.
1 tablespoon sugar.
Speck salt.
Vanilla to taste.

[1] Without sugar.

Soak gelatin in the cold water 5 minutes; add the scalded milk and dissolve. Add the sugar, salt, cream and vanilla. Stir occasionally until the mixture thickens; pour into cold, wet after-dinner coffee cups, or egg cups, and chill. Serve with Soft Custard, or cream and sugar.

PEPTONISED MILK JELLY, 517 CALORIES[1]

(Three Servings.)

1 pint "specially peptonised milk," hot.
½ box gelatin.
Sugar to taste.
Rinds and juice of one fresh lemon and orange.
2 or 3 tablespoons best St. Croix rum, or brandy, etc.

Soak the gelatin in a cup of cold water, pour the hot milk over it and add the sugar; stir until dissolved, then throw in the lemon and orange rinds.

Squeeze the juice of the lemon and orange into a glass and strain; stir in the rum or brandy, etc., then mix with the milk and gelatin; strain.

When the mixture has cooled to a syrup so as to be almost ready to set, pour into molds or glasses wet in cold water and put on ice or in cold water or in a cold place to harden; if it is too warm when poured into the molds, it is apt to separate in setting.

PANOPEPTON JELLY, 242 CALORIES

(Three Servings.)

1 ounce fresh celery (cut in small pieces).
½ small box best gelatin.
¼ teaspoon salt.
2 dashes pepper.
6 tablespoons Panopepton.
2 cups cold water.

Soak the gelatin in one-half cupful of cold water for one hour; put the water and celery in a double boiler on the fire and simmer one-half hour; add the salt, pepper, and soaked gelatin and stir until it is dissolved; remove from fire, add Panopepton; stir, and strain through linen into a jelly-jar, and set near ice. Serve in small quantities.

[1] Without sugar.

DATE JELLY, 1105 CALORIES

½ lb. Dromedary Dates.
½ pint strawberry gelatin jelly.
½ pint orange gelatin jelly.

Pit dates and fill with walnuts chopped fine. Pour half the strawberry mixture in a mold and when it begins to harden, cover with layer of dates and half the orange mixture. When this hardens repeat the process until all the ingredients are used. Keep on ice until perfectly firm. Serve with cream.

MEAT JELLIES

See "Meat Jellies" for recipe. Page 221.

STARCHY JELLIES

See "Starchy Jellies" for recipe. Page 244.

SNOW PUDDING, 934 CALORIES

(Six Servings.)

¼ box shredded gelatin or
1 tablespoon granulated gelatin.
¼ cup cold water.
1 cup boiling water.
1 cup sugar.
¼ cup lemon juice.
Whites 3 eggs.
1 teaspoon lemon extract.

Soften gelatin in cold water, add boiling water and dissolve. Add sugar, fruit juice and extract, and stir until sugar is dissolved. Set bowl into chopped ice, or ice water, to cool, stirring occasionally; when jelly is quite thick fold in the stiffly-beaten whites of eggs, and put into cold, wet molds. Put on ice to harden. When firm, remove from molds and serve with Soft Custard No. 1.

SNOW PUDDING, 222 CALORIES

(Individual Rule.)

2 teaspoons granulated gelatin.
3 tablespoons cold water.
⅓ cup boiling water.
1½ tablespoons lemon juice.
3 tablespoons sugar.
White 1 egg.

Make same as preceding.

SPANISH CREAM, 912 CALORIES

(Three Servings.)

¼ box shredded gelatin or
1 tablespoon granulated gelatin.
¼ cup cold water.
½ cup boiling water.
2 cups milk.
Yolks 3 eggs.
6 tablespoons sugar.
¼ teaspoon salt.
Whites 3 eggs.
1 teaspoon vanilla.

Soften the gelatin in the cold water, add the boiling water and dissolve. Heat the milk in a double-boiler. Beat the yolk of eggs, add sugar and salt, and pour the hot milk gradually onto the mixture. Return to double-boiler and cook until it thickens, stirring constantly. Add the strained gelatin and the flavoring, and fold in carefully the well-beaten whites. Pour into cold, wet molds to harden. Serve with Soft Custard No. 1, or with Whipped Cream.

SPANISH CREAM, 303 CALORIES

(Individual Rule.)

1 teaspoon granulated gelatin.
1 tablespoon cold water.
3 tablespoons boiling water.
⅔ cup milk.
Yolk 1 egg.
2 tablespoons sugar.
Speck salt.
White 1 egg.
¼ teaspoon vanilla.

Make same as preceding, and serve with Orange Sauce.

ORANGE SAUCE, 136 CALORIES

(Three Servings.)

Beat white of one egg very light, add two tablespoons sugar gradually, beating constantly, then add one and one-half tablespoon orange juice and one teaspoon lemon juice.

BAVARIAN CREAM, 205 CALORIES

(Individual Rule.)

1 teaspoon gelatin.
1 tablespoon cold water.
¼ cup milk.
Yolk 1 egg.
½ tablespoon sugar.
¼ teaspoon vanilla.
¼ cup whipped cream.

Soak gelatin in cold water 5 minutes. Heat the milk and pour into the beaten yolk of egg and add this mixture to gela-

tin; stir until gelatin is dissolved and flavor. Set in ice water to cool, beating almost constantly. When it begins to stiffen, fold in the whipped cream. Pour into molds. Serve with whipped cream.

Note.— Chocolate may be added by omitting flavoring and add chocolate to hot milk and dissolve before adding to the yolk.

GRAPE FLUFF, 957 CALORIES

(Six Servings.)

¼ box shredded gelatin or	1 cup grape juice.
1 tablespoon granulated gelatin.	Juice 1 lemon.
¼ cup cold water.	Whites 3 eggs.
¾ cup sugar.	

Soften the gelatin in cold water and dissolve by standing the dish in hot water. Dissolve the sugar in the fruit juice, and strain the gelatin into it. Set in ice and water, and stir occasionally until the mixture begins to thicken, then add gradually the well-beaten whites of eggs, and beat until the whole is very light and stiff enough to hold its shape. Pile lightly in glass serving-dish, or mold and serve with Whipped Cream or Soft Custard.

ORANGE CHARLOTTE, 350 CALORIES

(Individual Rule.)

2 teaspoons gelatin.	3 tablespoons orange juice.
1 tablespoon cold water.	1 tablespoon lemon juice.
⅓ cup boiling water.	Whites 2 eggs.
⅓ cup sugar.	

Blend as for Orange Gelatin and set the bowl into chopped ice or ice-water to cool; stir occasionally. When jelly is quite thick, fold in the stiffly-beaten whites of eggs. Mix well and pour into cold, wet molds. Put on ice to harden. When firm, remove by dipping mold quickly in warm water; loosen with knife, allowing air to enter. Serve with Soft Custard No. 1.

Note.— Line molds with lady fingers or slices of sponge cake and pour in the charlotte.

STRAWBERRY MOUSSÉ, 2284 CALORIES

¼ box shredded gelatin or
1 tablespoon granulated gelatin.
¼ cup cold water.
¼ cup boiling water.
1 pint thick cream.
½ cup powdered sugar.
1 cup strawberry juice.

Soften the gelatin in the cold water; add the boiling water and dissolve. Whip the cream until stiff, and add the powdered sugar. To the gelatin add the strawberry juice, fold the cream in carefully, turn into a wet mold and pack in salt and ice for two hours.

THE MADE-IN-A-MINUTE DESSERT, 395 CALORIES

Dissolve one package of Jell-O in one pint of boiling water. Pour into a mould and put in a cold place to harden. When set turn out on a plate and serve with whipped cream. Wine Jelly can be made by using one-fourth cup of good wine with the Lemon Jell-O, and using that much less water.

JELL-O AND FRUIT, 395 CALORIES

After dissolving the Jell-O (any flavor) in a pint of boiling water, pour it into the mould, or dish and set it in a cold place. When it has begun to thicken and the fruit will remain in place and not rise to the top, put in the fruit, placing it in position with a fork. Berries, fresh or canned, or sliced oranges, bananas or other fruit, and nutmeats also, may be added in the manner described. Serve with whipped cream. This recipe may be varied indefinitely by using different flavors of Jell-O and different fruits.

BEEF PREPARATIONS

BEEF JUICE — BEEF TEA — RAW BEEF

BEEF JUICE

Composition. The juice of meat contains considerable protein, in addition to salts and extractives.

General Principles in Cooking. From raw meat we cannot obtain as much meat juice as is easily taken from the same amount of meat when previously heated.

1 Calculated without fruit.

The reason for this is that the envelope enclosing the muscular tissue is a tough substance, which swells and dissolves when heated, yielding gelatin, and the liquid portion of the meat is easily expressed. If cooked too long the protein largely coagulates and the meat loses most of its moisture and becomes tough.

A steak thoroughly heated through swells, and when cut the liquid portion flows out readily. One pound of meat yields about four ounces of juice.

Care in Serving. In administering beef juice great care should be taken in reheating not to heat it above 136 degrees Fahrenheit, at which temperature albumin coagulates in flakes.

Substitutes for Beef Juice. A solution of white of egg flavored with meat extract makes a cheap and efficient substitute for beef juice.

Prepared extracts of good make may be used to advantage with beef juice to add flavor and make it more appetizing.

Absorption. Beef juice is absorbed in the rectum to nearly the same extent as complete peptones and is an excellent article of diet where solid foods cannot be given.

Comparative Food Value of Beef Juice and Beef Tea. Beef juice, although fourteen times as rich in protein as beef tea, is raw in flavor, and is rejected by many palates. In such a case, add a small quantity of beef tea or prepared beef extract for flavor.

Thus by the union of two bodies, one rich in protein and the other rich in flavor, we have a superior food. Prepare a small quantity at a time, as it does not keep well.

BEEF TEA

Composition. Meat treated with hot water contains only a small percentage of solids and almost no protein except extractive matter and soluble mineral matter. The clear liquid which remains when the coagulated albumin is strained out of beef tea contains only extractive or flavoring substances with the soluble mineral matter of the meat. There-

fore it should not be strained, and if properly prepared the albumin will not be coagulated to so great an extent.

Even in strong beef tea which is carefully made the amount of proteids present has been found to be less than 2 per cent.

Nutritive Value. Beef tea is valuable in the sick room not as a food, but as a flavoring; the liquid with the heat of the water acts as a stimulant.

Beef Extracts are prepared in both liquid and solid form. They have but slight nutritive value, containing but 4 to 5 per cent. of protein, but are valuable for their flavoring properties. They are used to advantage in combination with beef juice, adding flavoring and making it more palatable and appetizing.

RAW BEEF

Uncooked Meat. Raw meat is not quite as easily digested as cooked meat, and owing to color and flavor is not appetizing, and could not be taken continuously. However, when chopped fine, or scraped free from connective tissue, it is very readily digested and can be served disguised or very slightly cooked in many dainty ways.

Comparative Food Value of Raw Beef and Beef Tea. It can readily be seen that raw meat served chopped fine or scraped contains all the nutriment of the meat, whereas beef tea as seen from the manner of preparation, contains only the extractives and soluble mineral matter of meat.

BEEF JUICE

100 grams (3½ oz.) = 25 Calories.

Select a piece of meat from the rump or top of the round. Remove all fat and broil or warm slightly one or two minutes, to set free the juices; lay on plate and cut meat in various directions that more juice may be extracted; then squeeze out the juice by means of a press, lemon squeezer or potato ricer into a slightly warmed cup. Salt if necessary, and serve at once. Prepare only enough to serve, as it does not keep well. Serve in dainty china cup to disguise color. One pound of meat yields four ounces of juice.

BEEF JUICE (FOR INFANTS), 20 CALORIES

This food is very useful in forms of diarrhœa and dysentery. A half pound of chopped lean meat is made into an oval, flat mass, placed on a broiler and slightly browned. The juice is then expressed with a small meat press, mixed with equal parts of barley water and salted to suit the taste.—Koplik.

BEEF ESSENCE

100 grams (3½ oz.) = 23 Calories.

Put one-half pound round steak (freed from fat, etc.) through a meat chopper; put into small glass fruit jar with one tablespoon cold water. Place jar in a kettle of cold water, heat gradually and keep at temperature 150 degrees Fahrenheit (which is 62 degrees below the boiling point of water) for two hours. Strain and press the meat to obtain all the juice. Season with salt. Serve in slightly heated dainty china cup to disguise color.

Note.— A small piece of raw beef, broiled slightly, then cut up and added to above, gives a better flavor.

Liquid thus obtained should be red with albuminous juice in solution and not coagulated; it is nutritious, and may be kept in refrigerator twelve hours. Serve in small quantity slightly heated; or it may be made into beef tea by diluting with boiling water. Beef essence given ice cold is often grateful to a fever patient.

LIQUID PEPTONOIDS, 28 CALORIES

Add one tablespoonful of Liquid Peptonoids to one-half cup of boiling water; add pinch of salt. Sip slowly. This will be found particularly grateful in painful affections of the throat.

Note.— To serve cold, pour one tablespoonful Liquid Peptonoids over a small glass of finely cracked ice. Allow it to chill thoroughly and sip slowly.

BEEF TEA

½ pound steak.	Salt.
1 cup cold water.	

Wipe steak, remove all fat and cut in small pieces. Put in glass fruit jar, add the cold water and let it stand fifteen minutes to draw out the juice. Cover jar, using rubber band and cover, place on trivet in a kettle and surround with cold water. Allow water to heat slowly to 150° F. (no higher), and keep at this temperature two hours. Strain and season with salt. Remove fat with soft paper or bread. Reheat over hot water to 130° F. and serve in heated cups.

Note.— If possible cool beef tea before serving that fat may be removed more thoroughly.

BEEF TEA FROZEN

Beef tea may be frozen to the consistency of a water ice. Very grateful to a fever patient.

BEEF TEA WITH HYDROCHLORIC ACID

100 grams (3½ oz.) = 25 Calories.[1]

Select one-half pound of good beef; remove everything that is not clear meat. Chop it fine. Put in pint fruit jar and add one cup cold water and five drops *dilute hydrochloric acid.* Stir and set in refrigerator or any cold place for two hours to digest. Then strain, season with salt and serve in some dainty china cup on account of color. If one should object to color, heat the tea in a double boiler just till color changes. Do not strain. Beef tea made in this way is recommended by physicians for feeble children and patients much weakened by sickness.

ICED PANOPEPTON, 30 CALORIES

To a small glass half-full of clean crushed ice add one tablespoonful of Panopepton; let it stand a moment and then sip slowly.

PANOPEPTON — HOT, 36 CALORIES

To a small teacup two-thirds full of boiling water, add one tablespoonful of Panopepton, and one teaspoonful of *fresh* lemon juice — a little sugar, if desired — stir. Drink im-

[1] Calculated as beef juice.

mediately, sipping slowly. This gives a pleasant sense of warmth when one is chilly, and is excellent in cases where light nourishment is required before retiring.

SCRAPED BEEF

100 grams = 142 Calories.

Wipe a small piece of steak, cut from top of round. Lay it on a meat board, and with a sharp knife scrape off the soft part until there is nothing left but the tough, stringy fibers. Make it into little flat, round cakes half an inch thick and broil them two minutes. Season with salt and pepper if allowed. Serve on rounds of buttered toast. Do not add salt before cooking, as it toughens the meat.

RAW BEEF SANDWICHES

1 ounce scraped beef.................. = 40 Calories.
1 ounce bread (1 slice) .... = 73 Calories.

Prepare meat as for scraped beef, season and spread on bread cut very thin. Put slices on top, sandwich-fashion, and cut in fancy shapes. Serve in this manner or toast daintily.

BROTH AND MEAT JELLIES

Broth is a liquid containing the juices of soluble parts of meat and bone, which have been extracted by long, slow cooking.

This liquid is more or less solid when cold, according to the gelatinous nature of the ingredients. It varies greatly in quantity, according to the manner in which it is prepared and the material used. The cheaper, inferior parts of meat yield more nutriment than the expensive cuts.

Composition. Broth contains almost no protein except extractive matter with soluble mineral matter and gelatin.

Objective Point and General Principles in Cooking. The chief object in making broth is to obtain the largest possible amount of nutriment from the meat. This is best accomplished by observing the following rules:

Cut meat into small pieces.

Soak in the cold water before heating.

Use a careful selection and proportion of meat, bone and water. (The usual proportion is one pint of water to one pound of meat.)

Season judiciously.

Use steam-tight kettle; simmer (not boil), that the juice may be fully extracted.

Make it the day before using, that the fat may be removed more easily.

Long, slow cooking.

Broth may be made from beef, mutton or chicken. Rice, barley, white or whole egg, etc., may be added, if allowed, to increase the quantity of nourishment.

Comparative Value of Broth and Beef Tea. Broth differs from beef tea in that it contains gelatin, besides the extractives or flavoring substances and soluble mineral matter that are found in beef tea. Gelatin is obtained from meat and bones by long, slow cooking, and it is useful in convalescence and in febrile states. (Note "Gelatin," p. 203.)

Meat Jellies are a condensed form of broth, which forms an agreeable way of serving protein food to an invalid, and are especially valuable in febrile states. Although they do not entirely replace protein in the diet, they produce a considerable quantity of energy. (Note "Gelatin," p. 203, for nutritive value.)

ENERGY VALUE OF BROTH

Very few analyses of broths are available; hence no attempt has been made to state the calories under each recipe. The following table gives an approximate idea of their energy value:

Beef broth	100 grams yield 16.5 Calories.
Beef juice	100 grams yield 25 Calories.
Clam bouillon	100 grams yield 2 Calories.
Consomme	100 grams yield 12 Calories.

Food that may be added for extra nutriment

1 whole egg (average)	45 grams yield	60 Calories.
White of 1 egg (average) .	25 grams yield	13 Calories.
Yolk of 1 egg (average) ..	13 grams yield	48 Calories.
1 tablespoon rice.........	15 grams yield	50 Calories.
1 tablespoon barley	27 grams yield	90 Calories.

MUTTON BROTH

- 2 pounds mutton, cut from forequarters.
- 1 quart cold water.
- 1 teaspoon salt.
- Speck pepper.
- 2 tablespoons boiled rice or barley.

Wipe meat, remove skin and fat and cut into small pieces. Put in a kettle with bones that have been well broken, add cold water and let it stand one-half hour to extract the juices. Heat gradually to boiling point, skim, and when partly cooked season with salt and pepper. Simmer four hours, or until meat is tender. Do not allow it to boil. Remove fat and strain through a coarse sieve. Serve hot. If broth is made the day before it is used, it can be cooled thoroughly and the fat be removed easily. In reheating use double boiler. Two tablespoons of cooked rice or barley may be added if desired. The barley should be soaked over night or several hours before cooking. Taste and season before serving, a teaspoon of chopped parsley may be added just before serving if desired.

Note.— For weaker broth, use one quart of water to one pound of meat.

BEEF BROTH

Prepared same as Mutton Broth.

BROTH WITH GRAINS

- 1 quart hot broth.
- 1 tablespoon rice or barley.

To the hot broth add the well-washed rice. Simmer slowly until the rice is tender, adding more broth if it evaporates. The broth should be strained before using.

CHICKEN BROTH

3½ pounds chicken.
3 pints cold water.
2 tablespoons rice.
1 teaspoon salt.
Speck pepper.

Thoroughly clean a chicken (see "Poultry," p. 153), remove skin and fat; separate at the joints and wipe with a wet cloth. Put in kettle and add the cold water and let stand one-half hour. Heat very slowly and simmer three hours, or until meat is tender. When half-cooked skim off fat and add the rice and seasonings (and if desired, a small onion). When meat is tender, skim off fat and strain, taste and season properly and serve hot. When possible, make broth the day before using, that it may be thoroughly cooled and the fat removed easily. Reheat in a double boiler. The rice may be cooked, and rubbed through strainer before adding to broth, or it may be omitted if desired. An old fowl, not too fat, is best for broth.

VEAL BROTH

Prepared same as Chicken Broth (use cut from loin or knuckle of veal).

CLAM BROTH NO. I

Take five clams, wash and scrub well and put in saucepan with cold water to cover. Cook until shells open, remove from pan and take out clams. Chop and put them back into broth. Cook fifteen minutes. Strain through muslin; serve hot. If too strong flavor, add hot water.

Note.— If made in large quantity, use two or three clams to one cup water.

This broth may be frozen to the consistency of a frappé.

CLAM BROTH NO. II

½ cup clam broth.
1 cup water or milk.
Pepper.
¼ teaspoon butter.

Blend the clam broth and water (or milk), and heat to the boiling point. Season with salt to taste, and if allowed, a little pepper and the butter. Serve hot in dainty cups.

EGG BROTH

If one cannot conveniently get protein from meat, a very nutritious broth may be made by means of hot water into which an egg has been stirred. Heat three tablespoons of water to not above 149 degrees Fahrenheit (below the simmering point), and pour it gradually into a raw egg. The liquid is milky if the yolk is used; clear if only the white is used. It has little taste, which is an advantage with many patients. This broth may be flavored with beef extract or hot prepared broth may be used in place of the hot water.

Note: The white or yolk of egg may be used separately.

PREPARED BROTHS

Prepared Mutton Broth, Beef Broth, Chicken Broth and Clam Broth ready for use and of reliable quality, can now be purchased at best grocers. The Franco-American brand tins contain ½ pint or 8 oz. of Clear Broth, making a good cupful. Additional food value can be given to the Meat Broths thus prepared by the addition of either one even teaspoon of patent barley flour, arrowroot, farina or two teaspoons of sago. These different ingredients should be cooked slowly in the Broth for ten or twelve minutes.

MEAT JELLIES

CALF'S FOOT JELLY

100 grams = 65 Calories.

1 calf's foot.
1 quart cold water.
3 cups sherry wine (best Topaz).
Juice of one lemon.
Rind of ¼ lemon (yellow part only).
½ cup cut or cube sugar.

Clean calf's foot and put into the cold water; bring slowly to boiling point, and boil five hours; skim if necessary, while cooking. Strain through cheese-cloth and allow it to stand until firm and remove the fat.

Mix lemon juice, wine, the whites and shells of eggs, sugar and beat all together until the sugar is dissolved, then add to the jelly. Place on the fire in an enamel stewpan, and stir constantly until the mixture is very hot, but not boiling; strain through a jelly bag, made of cotton flannel, and allow

the jelly to drip through same slowly, pour into molds or glass jars, and put in cold place to harden.

Note.— Several varieties may be made by substituting the different flavors, brandy, rum, port wine, champagne, orange and lemon juice.

CHICKEN JELLY

3 pounds chicken.	8 peppercorns.
1 quart cold water.	Salt.

Prepare chicken as for chicken broth and cut flesh and bone into small pieces. Put into saucepan with cold water and peppercorns and let stand one-half hour. Bring slowly to the boiling point, remove scum and cook five or six hours or until meat is very tender and water is reduced to one pint, while cooking keep it below the boiling point. Skim frequently while cooking, strain through double thickness of cheese-cloth, season to taste and let stand until firm. Remove fat, reheat and turn into glass fruit jars or individual molds and cool; put in ice box until jellied.

Additional flavor may be added if desired, a stalk of celery or a small piece of bay leaf may be cooked with the chicken.

Note.— Mutton Broth Jelly may be treated in the same way.

BEEF JELLY

3 pounds solid meat from the shoulder or shin.	4 quarts cold water.
3 pounds bone from same.	2 teaspoons salt.

Take off the dried skin and any soft or bloody portion. Cut the meat into small pieces and put it with the cracked bone into an earthen jar. Cover with the cold water. Set in slow oven and cook from eight to twelve hours. Strain through a colander. Add salt to taste; cool quickly. When cold remove the fat. Serve cold as a jelly, or reheat in double boiler.

SOUP AND SOUP ACCOMPANIMENTS

Soup is a light and suitable form of food for the sick. There are two classes — those made with meat and those without meat.

The soups with meat are an infusion of meat, flavored with salt and some condiment. They are treated in the chapter on broths.

The foundations of soups without meat are milk, vegetables and water. They are dainty and nutritious, and an excellent way of serving milk and the starch and mineral matter of the vegetable.

They may be served as a luncheon, with crisp crackers, or as the first course of a dinner. Serve daintily in heated bouillon cups, partly filled, on small plate and doily.

General Rule for blending:

(*a*) Prepare vegetables, cook and strain.

(*b*) Prepare cream sauce: Melt butter, add the flour and gradually pour on the scalded milk or water. Cook thoroughly.

(*c*) Blend (*a*) and (*b*). Season, strain and serve immediately.

In the preparation of these soups great care must be taken that the starch of the vegetable and of the flour used in the thickening is thoroughly cooked. Cooking temperature of starch is 212 degrees Fahrenheit.

CREAM OF ASPARAGUS SOUP, 313 CALORIES

(Individual Rule.)

¼ bundle asparagus.	¾ tablespoon flour.
1 cup milk.	Salt.
½ tablespoon butter.	Pepper.

(*a*) Wash the asparagus and cook in boiling salted water, boiling gently thirty minutes. Take from the water, cut off the tips and put them into the serving dish; press the remainder through a colander.

(*b*) Scald the milk. Melt the butter, add the flour and

pour on gradually the scalding milk. Cook thoroughly, stirring often.

Blend (*a*) and (*b*); reheat, season to taste, strain over tips and serve at once with crisped wafer crackers.

Note.— For individual quantity use one-half recipe.

CREAM OF CORN SOUP, 493 CALORIES

(Two Servings.)

½ cup corn.	1 cup milk.
½ cup cold water.	1 tablespoon flour.
¼ slice onion.	1 tablespoon butter.
Salt and pepper.	Yolk 1 egg.

(*a*) Chop corn, add water and simmer twenty minutes; rub through a sieve.

(*b*) Scald milk with onion; remove onion. Melt butter, add flour and gradually pour on milk.

Blend (*a*) and (*b*); cook thoroughly, season to taste with salt and pepper and pour onto the beaten yolk. When well blended, serve hot.

Note.— The yolk of egg may be omitted.

CREAM OF CELERY SOUP, 320 CALORIES

(Two Servings.)

4 stalks celery.	1 tablespoon butter.
½ cup boiling water.	1 tablespoon flour.
Salt and pepper.	1 cup rich milk.

(*a*) Wash and scrape the celery and cut into small pieces, add the water and cook until very tender and soft. Renew the water if it boils away. Mash the celery in the water in which it was cooked.

(*b*) Scald milk. Melt the butter in a saucepan, add flour and pour on gradually the scalded milk. Cook thoroughly, stirring carefully.

Blend (*a*) and (*b*); season to taste; strain and serve immediately with croûtons or crisped crackers.

CREAM OF CELERY SOUP (FOR THE DIABETIC), 226 CALORIES

(Three Servings.)

6 stalks celery.
1 slice onion.
1 cup water. 1 cup hot milk.
Speck cayenne pepper, salt.
½ teaspoon butter.
½ teaspoon Gum Gluten Flour.

Boil, mash and strain the first three ingredients, add the hot milk or cream. Melt the butter, add the flour and pour on gradually the hot soup stock; season and cook thoroughly.

CREAM OF PEA SOUP, 215 CALORIES

(Individual Rule.)

¼ can peas.
½ teaspoon sugar.
⅓ cup cold water.
Salt and pepper.
½ cup milk.
½ tablespoon butter.
½ tablespoon flour.

(*a*) Drain peas from their liquor, rinse thoroughly, add sugar and cold water and simmer twenty minutes. Rub through a sieve; reheat.

(*b*) Scald milk. Melt butter, add flour and pour on gradually the scalding milk. Cook thoroughly, stirring carefully.

CREAM OF PEA FLOUR SOUP P. 202 CALORIES

(Individual Rule.)

1 tablespoon pea flour.
1 cup cold milk.
Salt.
Pepper.

Put the pea flour into a saucepan and pour on gradually the cold milk. Cook over direct heat, stirring constantly until flour is thoroughly cooked (about 10 or 15 minutes). Season with salt and pepper, serve hot. Bean, lentil, rice or barley flour may be used in the same way.

Note.— In making a large quantity use double boiler. Cook over direct heat 10 minutes and place over hot water.

CREAM OF ONION SOUP, 297 CALORIES

(Individual Rule.)

1 onion.
1 cup milk.
¾ tablespoon butter.
¾ tablespoon flour.

Cut onion in small pieces and scald in milk. Melt butter, add flour and add gradually the milk mixture and cook well. Season with salt and pepper and strain.

ONION SOUP (FOR THE DIABETIC), 30 CALORIES

One Bermuda or three green onions boiled until tender in stock or water; mash and strain. Add one-half teaspoon Gum Gluten Flour, one-half teaspoonful butter and a little chopped parsley. One tablespoon of cream, if desired.

CREAM OF POTATO SOUP, 220 CALORIES

(Individual Rule.)

¾ cup milk.
¼ slice onion.
¼ cup mashed potatoes.
½ tablespoon butter.
½ tablespoon flour.
¼ teaspoon salt.
Pepper.

(*a*) Scald milk with onion in it, remove onion and add milk slowly to potatoes. (*b*) Melt butter, add flour and pour on gradually the hot mixture. Cook thoroughly and season to taste. A little celery salt may be added if desired. A little finely-chopped parsley may be sprinkled over top of soup.

CREAM OF RICE SOUP, 302 CALORIES

(Individual Rule.)

1 tablespoon rice.
1 cup milk.
¾ tablespoon butter.
⅛ small onion.
Stalk celery.
⅛ bay leaf.
Salt.
Pepper.

Scald the milk, add the well-washed rice and cook in double boiler thirty minutes, covered closely.

Melt butter in sauté pan, add the sliced onion and cook till tender, but not brown. Add celery sliced, and turn into scalded milk; add the bay leaf, cover and let stand on back of stove fifteen minutes. Strain, season with salt and pepper, reheat and serve.

Note.— If soup is too thick, add a little heated milk.

TOMATO SOUP (WITH BROTH), 110 CALORIES

(Individual Rule.)

½ cup strained tomatoes.
½ tablespoon butter.
½ slice onion.
1 tablespoon flour.
1 cup water or stock.
¼ teaspoon salt.
Speck pepper.

(*a*) Cook and strain tomatoes, obtaining one-half cup juice.

(*b*) Melt butter, add the onion and brown slightly; add the flour; pour on gradually the boiling water or stock.

Blend (*a*) and (*b*); cook thoroughly, season with salt and pepper, strain and serve.

Note.— Two tablespoons of cream may be added.

Beef or mutton broth strained may be used in place of water if desired.

CREAM OF TOMATO SOUP (FOR THE DIABETIC), 224 CALORIES

(Two Servings.)

½ cup tomatoes.
1 slice onion.
1 cup milk.
½ teaspoon butter.
½ teaspoon Gum Gluten Flour.
Salt, pepper.

Stew and strain the tomatoes and onion, reheat and add a tiny pinch of soda. When effervescing subsides add milk. Melt the butter, add the flour and pour in gradually the hot stock. Season and cook thoroughly.

MOCK BISQUE SOUP, 324 CALORIES

(Individual Rule.)

½ cup tomatoes.
⅛ saltspoon soda.
Salt and pepper.
1 cup milk.
1 tablespoon butter.
¾ tablespoons flour or cornstarch.

(*a*) Steam tomatoes until soft enough to strain juice; strain, add soda and allow gases to pass off. This prevents the acid of the tomato curdling the milk.

(*b*) Scald milk; melt butter in quart size saucepan, add the flour and pour on gradually the scalding milk. Cook thoroughly, stirring carefully.

Blend (*a*) and (*b*); reheat, season to taste, strain and serve immediately with croûtons or crackers.

DRIED FRUIT SOUP, 209 CALORIES [1]

¼ cup dried apricots.
¼ cup prunes.
1 cup cold water.
Sugar to taste.

[1] Without sugar.

Pick over and wash fruit until perfectly clean. Cook in the water until very soft. Strain and squeeze out all the juice; sweeten to taste. Thicken if liked.

Thickening.— 1 slightly rounding teaspoon rice flour to 1 cup liquid. Cook twenty minutes to remove raw taste of starch.

PANOPEPTON BOUILLON — HOT, 30 CALORIES

Put one tablespoonful of Panopepton into a small teacup; fill the cup nearly full of boiling water, and flavor to taste with celery salt, or plain salt and pepper; stir, and sip slowly. This is a very nourishing and pleasantly stimulating drink.

VICTORIA SOUP (WITH BROTH), 619 CALORIES

(Two Servings.)

½ cup lean chicken meat.	1 cup rich milk.
1 cup strong chicken broth.	¼ cup cracker crumbs.
½ teaspoon salt.	Yolks 2 eggs.
Pepper.	

Soak the crumbs in a little of the milk. Cook yolks of eggs in hot water until hard. Chop the chicken, mix with the soaked cracker crumbs, press the hard-cooked yolks through a coarse strainer, add the seasonings and the broth and cook all together five minutes over direct heat or one-half hour in double boiler. Serve hot.

CONSOMME

Make a beef or any broth according to the strength required. While cooking skim frequently, and when reduced to one-third of its quantity take from saucepan and strain; season well, cool quickly and remove fat. Return to saucepan, add a few thin slices of onion and one-half pound of lean beef chopped fine and *clear*.

To Clear Soup. To each quart of stock add the slightly beaten white and broken shell of one egg and a few shavings of lemon rind. Place on front of range, and stir constantly until boiling point is reached; boil two minutes. Set back where it may simmer twenty minutes; remove scum and strain through double thickness of cheese-cloth.

OYSTER SOUP

See chapter "Oysters" for recipe. Pages 171–172.

OYSTER STEW

See "Oysters" for recipe. Page 172.

CLAM SOUP

See chapter "Clams" for recipe. Page 174.

CLAM BOUILLON

See chapter "Clams" for recipe. Page 174.

CLAM BOUILLON BISQUE

See chapter "Clams" for recipe. Page 175.

MEAT SOUPS

Foundation for same, see chapter "Broths." Page 219.

SOUP ACCOMPANIMENTS

GLUTEN BISCUIT CRISPS

1 = 25 Calories.

Serve plain or butter slightly and bake until heated through.

CRISPED CRACKERS

1 Saltine = 15 Calories.

Split common crackers or use saltines. Put in pan and bake until thoroughly heated. Serve plain or buttered slightly.

TOASTED CRACKERS

Butter crackers, put in pan and bake until a delicate brown. Serve on small plate with doily.

CROUTONS

1 ounce (1 slice) bread = 73 Calories.

Take a slice of stale bread about half an inch thick, cut into half-inch cubes; put them in a shallow pan and dry thoroughly, then brown delicately. Stir often to brown evenly.

Serve on small plate with doily. A little butter may be spread on the bread if desired.

NOODLES FOR SOUP (FOR THE DIABETIC), 596 CALORIES

1 egg.
1 tablespoon milk.
5 ounces Gum Gluten Flour.

Beat the egg very light, add the milk and Gum Gluten. Roll very thin and cut in straws. Cook in any soup.

GLUTEN CRISP (FOR THE DIABETIC)

See chapter "Toast" for recipe. Page 256.

CHAPTER X

VEGETABLE OR PLANT FOODS

The important food products derived from the vegetable kingdom are the Cereals, Legumes — Roots and Tubers — Green Vegetables — Fruits — Nuts — Fungi — Lichens.

Composition. Vegetable or plant foods contain the five proximate principles, namely, proteins, fats, carbohydrates, water and mineral matter. In this they resemble animal foods. The food principles in the two classes are, however, in different proportions, animal foods being rich in proteins or fats, and seldom containing carbohydrate in appreciable amounts; while vegetable foods are, as a rule, rich in carbohydrates, and poor in proteins and fats.

These differences are clearly shown in the following table:

	Pro. %	Fat. %	Carb. %
Lean round of beef. Free from all visible fat	23.2	2.5	....
Lean round of beef. Very fat	16.1	23.1	....
Wheat flour (entire wheat)	13.8	1.9	71.9
Potatoes	1.8	0.1	14.7
Apples	1.6	2.2	66.1

The legumes and most nuts are exceptional in containing high percentages of protein or fat or both, but unlike meats, they also contain a very considerable amount of carbohydrate, as shown by the following analyses:

	Pro. %	Fat. %	Carb. %
Beans, dried	22.5	1.8	59.6
Peas	24.6	1.0	62.0
Almonds	21.0	54.9	17.3
Walnuts	16.6	63.4	16.1

Protein.[1] (1) Gluten of wheat and some of the other cereals.

(2) Legumin found in legumes.

(3) Vegetable albumin as found in some vegetables.

Carbohydrates of Vegetables[2] include — starch, sugar, vegetable gums and cellulose.

Fats of Vegetables[3] are in the form of oils and are similar in composition to animal fats, but are more easily digested and equal in nutritive value.

Water. Dry vegetable foods, such as cereals, dried beans and peas, nuts, dried fruits, etc., do not, as a rule, contain as much water as animal foods, but fresh vegetables and fruits contain frequently from 90 per cent. to 95 per cent. of water. This gives them a low nutritive value compared with their bulk. In cooking, water is added to most dry vegetable foods, so that when served they resemble fresh or succulent vegetable foods in this respect.

Mineral Matter.[4] All vegetable foods contain valuable ash constituents. In cereals, these are largely in the outer part of the grain, and are lost if the entire grain is not utilized. Thus polished rice is much poorer in ash constituents than unpolished; and white flour than entire wheat flour. Fresh vegetables and fruits are desirable in the dietary for their salts and organic acids.

Digestibility. Vegetable foods are less easily digested than animal foods, owing to their complex composition, and especially to the intimate mixture of the nutrients with cellulose. This prevents the digestive ferments acting readily upon the food-stuffs so that they are digested more slowly and less completely than animal foods. Although cellulose is indigestible, its presence under normal conditions in proper amounts, is advantageous,[5] but it should be thoroughly softened by cooking, except in the case of tender young vegetables such as lettuce.

[1] Protein, see p. 10.
[2] Carbohydrates, see p. 16.
[3] Fats of vegetables, see p. 20.
[4] Mineral matter, see p. 31.
[5] See p. 17.

Comparative Value of Animal and Vegetable Diets. An animal diet is concentrated and easily digested. If the animal foods taken are eggs and milk, no serious objection can be urged against them, except that they lack bulk. The food is so fully absorbed that the large intestine has no stimulus to action and no material for its muscles to act upon, and serious complications are likely to arise from constipation. If the animal food is largely meat, it is undesirable, not only for the reason above mentioned, but because excessive quantities of nitrogenous extractives are taken, which are likely to cause uric acid disorders and other disturbances, and also because important mineral salts are lacking (such as calcium, which carnivorous animals get by *eating bone*) ; and because the acids formed from the protein (phosphoric and sulphuric) tend to deprive the body of salts already present in the tissues.

A strict vegetable diet, on the other hand, while free from these objections, is necessarily very bulky, owing to the high percentages of water and cellulose, and to the fact that extra allowance must be made because it is less perfectly absorbed. Unless special care is taken, a vegetable diet is also likely to be low in protein. Legumes and nuts must form a considerable part of the dietary to provide this. When eggs, milk and milk products are added to the vegetable foods, the diet becomes mixed, and these objections no longer hold.

An Ideal Diet contains a mixture of animal and vegetable foods, so that protein, fat, carbohydrate and mineral matter are supplied in proper proportions and in available forms, and sufficient bulk is afforded for proper intestinal action.

CEREALS

GRUELS — BREAKFAST FOODS — STARCHY JELLIES — MACARONI

Wherever it is possible to grow grains, they are staples of man's diet. No food products of the vegetable kingdom equal them in importance. They are cheaply and easily grown, and contain all the food principles in unusually good proportion.

They can be kept for long periods, are not difficult to cook, and furnish a palatable and digestible article of diet. Cereals alone supply nearly one-fourth of the total food in a large number of the American families. Wheat, corn, rye, oats, barley, rice and buckwheat are in commonest use.

The natural grain is surrounded by an indigestible husk which is always removed. Grains simply hulled or husked, and slightly crushed are called groats or grits; more finely crushed, they constitute meal; ground to a powder and sifted they form flour.

Composition. Cereals contain all the food principles, with considerable cellulose, especially in the outer skin, which forms bran in milling. They are comparatively dry materials, having an average water content of about 10 per cent. The protein content is fairly high, averaging 12 per cent.–13 per cent.[1] The fat is never large in amount, and varies within wide limits, being greatest in corn and oats and their products, and lowest in rice.

The nutrients in largest proportion are the carbohydrates, which frequently constitute 75 per cent. of the whole. The ash content is as large as in most common food materials, and some of the grains, as oats and wheat, are especially valuable for their soluble phosphates of calcium, potassium, magnesium, etc.

The chemical composition of some of the most common cereals is shown in the following table:

	Water Per Cent.	Protein Per Cent.	Fat Per Cent.	Carbohydrates Starch, etc. Per Cent.	Carbohydrates Crude Fiber Per Cent.	Ash Per Cent.
Barley	10.9	12.4	1.8	69.8	2.7	2.4
Corn (maize)	9.3	9.9	2.8	74.9	1.4	1.5
Oats	11.0	11.8	5.0	59.7	9.5	3.0
Rice	12.4	7.4	0.4	79.2	0.2	0.4
Wheat (spring)	10.4	12.5	2.2	71.2	1.8	1.9

It will be seen that corn is relatively rich in fat; oats in both protein and fat; rye and wheat in protein with a moderate amount of fat; rice is notably free from crude fiber and fat, and also very low in ash.

[1] For further information, see "Cereal Breakfast Foods," Farmer's Bulletin No. 249, Agricultural Dept., Washington, D. C.

Cereal Breakfast Foods are very similar in composition to the grains from which they are made.

Macaroni is much like wheat breakfast foods in composition and food value.

Principles in Cooking. Cooking improves cereals in many ways. For the average person, proper cooking has almost as much to do with the nutriment finally obtained as the proportions of nutrients originally present. Flavor and appearance are improved, with the gain in digestibility that comes from appetizing foods which stimulate the flow of digestive juices. Cooking to convert nutrients into more digestible forms, is very important in the case of cereals which contain so much starch; and since the starch in these foods is surrounded by cell-walls of crude fiber (largely cellulose) upon which the digestive juices are unable to act, these walls must be broken down. Part of this disintegration may be accomplished in milling, and part by thorough mastication but complete digestion of the starch is assured only by thorough cooking.

Parching is one of the simplest methods of cooking grains. The invisible moisture in the cells is expanded by the heat, and the cell walls burst. Some of the starch is also made soluble or changed to dextrin by this process. The digestibility of protein seems to be lessened by cooking at high temperatures, but the starch can be made almost perfectly digestible.

The softening of cellulose is more perfectly accomplished by cooking for a long time in the presence of a large amount of moisture, as in steaming, or cooking with water or milk in a double boiler. The glutinous material which surrounds the starch grains and prevents their digestion is disintegrated so that the digestive juices can act. In general, the more crude fiber a cereal contains, the longer it should be cooked. Reference to the table (p. 234) shows that oats requires more cooking than rice; whole or partially crushed grains than finely ground ones. There is danger in undercooked cereals, not only of loss of valuable nutriment through failure

of digestion, but in irritation of the alimentary tract. This should be especially remembered in preparing partially cooked breakfast foods.

When cereals are cooked in water some of it is absorbed, and soluble substances in the food pass into the remaining water. If this is thrown away, as when rice is boiled in a large quantity of water and subsequently drained dry, a considerable part of the nutriment is lost. Rice water frequently contains enough dissolved starch to form a jelly on cooling. For this reason steaming is a preferable method. Practical application of the fact that certain nutrients in cereals are soluble is made in the preparation of all kinds of cereal waters and starchy jellies. (See Recipes, pp. 124–244.)

Gruels are thin porridges made from flour or other finely ground grain products, with either water or milk. They are cooked for a long time to insure the starch being changed to soluble starch, or even partially dextrinized. Time for cooking should therefore be conscientiously kept by the clock.

By passing the material through a cheese-cloth or sieve, the coarser, undissolved portions are removed, and the smooth product does not irritate weakened digestive organs; hence this method is desirable for invalids and young children.

In cooking all cereal products, the following points should be observed:

Use a double boiler.

Observe carefully the correct proportions of cereal, water and salt.

Cook at boiling temperature (212° F.).

Watch the time by the clock, and always cook the full time prescribed, preferably longer.

Serve attractively.

Improper cooking and poor serving are largely responsible for unpopularity of cereal foods.

Digestibility. The digestibility of cereals is greatly influenced by the mode of preparation and the thoroughness of insalivation. For the normal healthy person cereal foods are very wholesome. In general, about 90 per cent. or more of

the organic matter is assimilated. The carbohydrates are most completely digested; the protein shows a wide variation, but is less perfectly assimilated than the other nutrients, owing partly to the fact that it is often hardened in cooking and partly that it is intimately bound up with cellulose in the bran coats. For this reason white flour shows a higher degree of digestibility for protein, than do whole wheat preparations.

Among cereal breakfast foods, rolled wheat ranks first in digestibility, rolled oats next, and corn preperations among the lowest. The partially digested or ready-to-eat cereals supply more digestible material than the plain grains when well cooked.

Nutritive Value. Cereals supply actual digestible nutriments to the body more cheaply than any other class of foods except the dried legumes. All animal foods, especially meats, are more expensive, even as sources of protein, than cereals. A glance at their composition shows that they are chiefly fuel foods, because of their high carbohydrate content. Their cost varies with the cost of labor and fuel in preparing the food. The comparatively expensive ready-to-eat breakfast foods do not yield any extra nutritive value. Their only advantages are pleasant flavor and ease of serving. Cereal products yield on the average between 1600 and 1700 calories per pound. Thus:

1 lb. flour furnishes 1665 calories.
1 lb. entire wheat flour furnishes 1675 calories.
1 lb. corn meal furnishes 1655 calories.
1 lb. cornstarch furnishes 1675 calories.
1 lb. wheatlet furnishes 1685 calories.
1 lb. hominy furnishes 1650 calories.
1 lb. granulated corn meal furnishes 1665 calories.
1 lb. wheat germ furnishes 1695 calories.
1 lb. tapioca furnishes 1650 calories.

Care of Cereals. Cereals must be kept in a cool, dry place; warmth will favor the development of the maggot eggs; and moisture, when absorbed, makes them musty.

GRUELS

ARROWROOT GRUEL, 205 CALORIES[1]

(Individual Rule.)

2 teaspoons arrowroot.
2 tablespoons cold water.
1 cup boiling water or milk.
Salt.
Sugar, lemon juice, wine or brandy as required.

Blend the arrowroot and cold water to a smooth paste. Add to the boiling water or milk. Cook in double boiler two hours. Add salt. Strain and serve hot.

Arrowroot is the purest form of starch, and beneficial in case of diarrhœa if not given too hot.

BARLEY GRUEL, 248 CALORIES

(Individual Rule.)

1 tablespoon barley flour.
2 tablespoons cold milk.
1 cup scalded milk.
Salt.

Blend the barley flour with the cold milk and stir into the scalding milk. Cook in double boiler twenty minutes. Season with salt to taste, and add sugar if desired. Strain.

BARLEY GRUEL OR JELLY, 142 CALORIES[1]

(Individual Rule.)

1 tablespoon barley flour.
2 tablespoons cold water.
1 cup boiling water.
½ cup milk (if desired).
Salt.

Blend carefully the barley flour and the cold water; add gradually to the boiling water and cook twenty minutes. Add milk and salt to taste, reheat to boiling point, strain and serve or bottle for keeping.

Note.— For jelly omit the milk and strain.

RICE OR OAT GRUEL

Rice or oat gruel may be made in same way as Barley Gruel No. I or II, using the prepared flour for the purpose.

BARLEY GRUEL (WITH BROTH), 308 CALORIES

(Two Servings.)

2 cups beef broth.
2 tablespoons barley flour.
2 tablespoons cold water.
1 saltspoon salt.

[1] Calculated with milk.

Mix barley flour and salt with the cold water to form a smooth paste. Add gradually to the boiling stock and boil one-half hour. Strain and serve very hot.

CRACKER GRUEL, 243 CALORIES

(Individual Rule.)

2 tablespoons sifted cracker crumbs.
⅛ teaspoon salt.
1 cup scalded milk.

Pour hot milk gradually onto cracker crumbs, stirring constantly. Cook in double boiler five minutes or two minutes over direct heat.

Note.— Before preparing crumbs, crackers may be baked in a slow oven until a delicate brown; or graham crackers may be used. A convenient way to prepare the crumbs is to put them several times through a meat chopper and then sift.

FLOUR GRUEL OR THICKENED MILK, 212 CALORIES

(Individual Rule.)

¾ cup scalded milk.
¼ cup cold milk.
½ tablespoon flour.
Speck salt.
1 dozen raisins.

Scald the milk. Mix the flour with the cold milk to make a smooth mixture, and stir into the scalding milk. Cook in a double boiler one-half hour or on back of stove in a saucepan.

Stone and quarter the raisins, then add water enough to cover; cook slowly until water has all boiled away. Add to gruel just before serving. Add salt. Strain and serve, or it may be eaten with the raisins in it.

Note.— This gruel may be made without the raisins. Never use raisins in bowel troubles.

FARINA GRUEL, 102 CALORIES

(Individual Rule.)

½ tablespoon farina.
¼ cup cold water.
½ cup boiling water.
½ cup scalded milk.
Salt.

Mix the farina with the cold water, add to the boiling water and boil thirty minutes. Add the scalding milk. Taste and season properly. A little sugar may be added if desired, or an egg may be beaten and the gruel poured into it.

GLUTEN GRUEL OR PORRIDGE (FOR THE DIABETIC), 185 CALORIES [1]

(Individual Rule.)

½ tablespoon Gum Gluten Flour.	1 cup hot water or milk.
1 tablespoon cold water.	Salt.

Add cold water slowly to Gluten Flour to form a thin paste, then add gradually to boiling water, while stirring constantly; cook fifteen minutes. Season with salt. Is an excellent food for the sick; for baby food it may be sweetened.

INDIAN MEAL GRUEL, 48 CALORIES [2]

1 tablespoon Indian meal.	2 tablespoons cold water.
½ tablespoon flour.	2 cups boiling water.
¼ teaspoon salt.	Milk or cream.

Blend the meal, flour and salt with the cold water to make a smooth paste, and stir into the boiling water. Boil gently one hour and a half. Dilute with hot water, milk or cream. Strain.

OATMEAL GRUEL NO. I, 70 CALORIES [2]

¼ cup coarse oatmeal.	1½ cup boiling water.
½ teaspoon salt.	Milk or cream.

Add oatmeal and salt to the boiling water, and cook four to five hours in a double boiler, adding more water if necessary. Strain and dilute with hot milk to make it of the right consistency. Reheat and serve.

Note.— Sugar, and a little port wine may be added if allowed and desired.

[1] Calculated with milk.
[2] Without milk or cream.

OATMEAL GRUEL, NO. II, 70 CALORIES [1]

¼ cup rolled oats.
1⅓ cup boiling water.
¼ teaspoon salt.
Milk or cream.

Mix the oats, water and salt in top of double boiler. Cook over direct heat five minutes and then over hot water one hour. Strain, bring to the boiling point and add milk or cream as desired.

OATMEAL GRUEL NO. III, 140 CALORIES [1]

½ cup coarse oatmeal.
2 cups water.
Salt.
Milk.

Pound the oatmeal in a mortar until it is mealy, then put it into a tumbler and fill it with cold water. Stir, and pour off the mealy water into a saucepan. Fill tumbler again, stir and pour off, and repeat until the above quantity of water is exhausted. Boil the oatmeal water thirty minutes, stirring frequently. Season with salt to taste. Thin with milk or cream to desired consistency.

EGG AND SHERRY GRUEL, 388 CALORIES

(Individual Rule.)

1 egg.
1 wineglass sherry.
1 teaspoon lemon juice.
1 tablespoon sugar.
Grating of nutmeg.
1 cup smooth hot gruel.

Beat the egg; add wine, lemon, nutmeg and pour on the hot gruel.

CAUDLE, 404 CALORIES [2]

¼ cup Scotch oatmeal.
2 quarts water.
Salt to taste.
½ cup raisins.
Juice ½ lemon.
Sugar, cinnamon, brandy, or wine.

Boil oatmeal, water and salt four or five hours. Strain; if too thick add a little hot water and whip it with a wooden spoon. Remove seeds from raisins, cook a short time in hot water, and add raisins and water to above. Add lemon juice, and sugar, cinnamon, brandy or wine to taste.

[1] Without milk or cream.
[2] Without sugar or liquor.

FLOUR BALL OR BOILED OR BROWNED FLOUR GRUEL (FOR TEETHING CHILDREN)

Tie one cup of wheat flour in a thick cloth, and boil it in one quart of water for three hours; remove the cloth and expose the flour to the air, or heat until it is hard. Grate from it when wanted. Put one tablespoonful into half a pint of new milk, and stir over the fire until it comes to a boil; add a pinch of salt and a tablespoon of cold water, and serve. This gruel is excellent for children afflicted with summer complaint. Or brown a tablespoon of flour in the oven, or on top of the stove in a baking tin; feed a few pinches at a time to a child, and it will often check diarrhœa.

BREAKFAST FOODS

Fruits served with breakfast foods make them more appetizing.

Follow directions on package for preparing patent or prepared cereals, allowing double the given time for cooking.

HASTY PUDDING OR CORNMEAL MUSH, 182 CALORIES [1]

(Individual Rule.)

¼ cup cornmeal.	¼ cup cold milk or water.
½ tablespoon flour.	½ cup boiling water.
¼ teaspoon salt.	

Mix the meal, flour and salt with the cold milk or water; when smooth, stir into the boiling water. Cook in a double boiler one hour or more; or over direct heat one-half hour. Serve with cream and sugar, turn into tins to cool if wanted for sautéing. Cut into slices, dip in flour and sauté in drippings or butter.

GLUTEN BREAKFAST FOOD (FOR THE DIABETIC), 665 CALORIES

(Two Servings.)

½ cup Gum Gluten Breakfast Food.	2 cups cold water. Salt.

Would suggest partly cooking the Breakfast Food the day

[1] Calculated with milk.

before using, as a long cooking improves the quality. Put the food in the water and cook over direct heat for fifteen minutes, then put in double boiler and cook for about one hour, adding salt to taste when nearly done. It is then necessary to cook it but twenty minutes in the morning. Serve with cream.

HOMINY AND DATES, 378 CALORIES

¼ cup fine hominy.
1⅓ cups boiling water.
¼ teaspoon salt.
6 Dromedary Dates.

Put the hominy, water and salt in top of double boiler and cook two hours. Add more boiling water if mush seems stiff and thick. Stone and chop the dates and add to the mush about three minutes before serving. Dates are delicious served with rice or combined with any cereal.

OATMEAL MUSH FOR CHILDREN AND INVALIDS, 880 CALORIES

(Four Servings.)

1 cup granulated oatmeal.
1 teaspoon salt.
1 scant quart boiling water.

Put the oatmeal and salt in a double boiler, pour on the boiling water and cook three or four hours. Remove the cover just before serving, and stir with a fork to let the steam escape. If the water in the lower boiler be strongly salted, the oatmeal will cook more quickly. Serve with sugar or salt and cream or milk.

Note.— Baked sour apples, apple sauce and apple jelly are delicious eaten with oatmeal. They should be served with the mush, and sugar and cream poured over the whole. They give the acid flavor which so many crave in the morning. Coarse oatmeal is not advisable in any form of water brash, acidity or bowel irritations. It often causes eruptions on the skin in warm weather.

BOILED RICE

See "Rice Puddings" for recipe. Page 297.

STEAMED RICE

See "Rice Puddings" for recipe. Page 298.

STARCHY JELLIES

BARLEY JELLY, 270 CALORIES

(Three Servings.)

3 tablespoons pearl barley.	½ saltspoon salt.
1 quart cold water.	

Soak barley over night, drain and add the quart of fresh water; add salt; and cook in double boiler steadily for four hours down to one pint, adding water from time to time; strain through muslin. When cold this makes a thick jelly. Two tablespoons dissolved in eight ounces of warmed and sweetened milk may be given at single feeding for infants.

Note.— Oatmeal wheaten grits and rice grains may be used in same way.

Jelly made with Barley Flour, see Barley Gruel, p. 238.

RICE JELLY, 181 CALORIES

(Three Servings.)

1½ tablespoons rice.	⅔ cup milk.
1 cup cold water.	1 white of egg.
Speck salt.	

Wash the rice and soak in cold water two hours, drain off the water and add the milk, cook in double boiler one and one-half hours. Strain through a fine sieve. Pour into molds, chill and serve with fruit juice or cream and sugar.

TAPIOCA JELLY, 200 CALORIES

(Three Servings.)

4 tablespoons pearl tapioca.	⅔ cup boiling water.
1 cup cold water.	Speck salt.

Soak tapioca in cold water three hours; add boiling water and salt; cook in double boiler two and one-fourth hours. Serve hot, plain with cream, wine and powdered sugar, or flavor while hot with lemon juice, and chill.

CORNSTARCH JELLIES

See "Cornstarch Pudding" for recipe. Page 295.

MACARONI

BOILED MACARONI, 98 CALORIES[1]

(Individual Rule.)

¼ cup macaroni.	1 teaspoon salt.
3 cups boiling water.	Cream or milk.

Break macaroni into one-inch pieces, put into a strainer and rinse with cold water. Cook in boiling salted water twenty minutes, or until tender. Strain, pour a little cold water over it to prevent pieces from adhering; add cream, reheat and season with salt; or serve with White or Tomato Sauce and grated cheese.

WHITE SAUCE, 152 CALORIES

(Individual Rule.)

½ cup milk.	½ tablespoon flour.
½ tablespoon butter.	¼ teaspoon salt.

Scald the milk. Melt the butter, remove from stove and add the flour and mix thoroughly, then pour on gradually the hot milk, stirring constantly while blending. Cook thoroughly until there is no raw taste of starch and season with salt.

TOMATO SAUCE, 93 CALORIES

(Individual Rule.)

⅓ cup strained tomato juice.	½ tablespoon flour.
½ tablespoon butter.	Salt and pepper to taste.

Scald the tomatoes. Melt the butter and remove from stove, add the flour and mix thoroughly, then pour on gradually the hot tomato, stirring constantly while blending; cook thoroughly until there is no raw taste of starch and season with salt and pepper.

BAKED MACARONI

1 tablespoon grated fresh cheese = 62 Calories.

Fill a buttered baking-dish with alternate layers of macaroni, White Sauce and cheese; then cover with buttered

[1] Without milk or cream.

cracker crumbs and bake until crumbs are a golden brown. Tomato Sauce may be substituted for White Sauce if desired.

BUTTERED CRACKER CRUMBS, 201 CALORIES

1 tablespoon butter. $\frac{1}{4}$ cup cracker crumbs.

Melt butter and add cracker crumbs that have been rolled fine. To be used for the top of any scalloped dish. Cracker crumbs or bread crumbs may be used and bits of butter dotted over top.

NOODLES (FOR THE DIABETIC), 596 CALORIES

(Individual Rule.)

1 egg, well beaten.
1 tablespoon milk.
5 ounces Gum Gluten Flour.

Beat egg, add milk and gradually add the Gluten Flour. Roll out and cut in thin strips. Serve with any soup.

BOILED NOODLES (FOR THE DIABETIC)

Put the noodles into cold, salted water; cook at least forty-five minutes after it comes to boil, or boil until it is tender. Season with pepper and butter. Serve with White Sauce.

CREAM OR WHITE SAUCE (FOR THE DIABETIC), 130 CALORIES

(Individual Rule.)

$\frac{1}{2}$ cup milk.
1 teaspoon butter.
1 teaspoon Gum Gluten Flour.

Melt the butter without browning it, add the flour, then pour in the scalded milk gradually, stirring all the time. Cook five minutes. Season with salt and red pepper to taste. Flavor with onion, lemon juice or parsley if desired. Pour over vegetables very hot.

NOODLES AU GRATIN (FOR THE DIABETIC)

1 tablespoon grated fresh cheese = 62 Calories.

Boil the noodles as above. Place them in a baking-dish in alternate layers with grated cheese, having cheese form the top layer; season with pepper and butter. Pour over the mixture the water in which the noodles were cooked; or, if preferred, cream or stewed tomatoes may be used to moisten.

BREAD

From the most remote times, bread has been an important part of the diet of mankind. It is to-day probably more generally and extensively used than any other one food-stuff, with the possible exception of milk. It is therefore extremely important to know what constitutes good bread and what are its nutritive properties.

Composition. The ingredients of bread are very simple — flour, water, yeast and salt. Any cereal, cleaned, crushed and sifted to a powder, may serve as the flour, but wheat flour makes the most satisfactory bread, because its proteins in the form of gluten have more elasticity than those of other cereals.

"Bread contains from 34 to 40 per cent. of water, and the remainder, about 60 per cent. at least, is nutritive material. It contains a large amount of carbohydrates, a moderate amount of protein, a small amount of mineral matter, and almost no fat. Owing to the excess of carbohydrates and deficiency of protein in wheat, bread could not serve alone for the proper nutritive of the body, because an amount of bread sufficient to supply the requisite protein would furnish much more carbohydrates than necessary. In a mixed diet this discrepancy is of little importance, as it is supplied by the other protein foods eaten. Most methods of increasing the protein contents of bread have a tendency to increase the cost, but skim milk can be used in place of water in the mixing with little added expense, and it will add about 2 per cent. increase as to protein." [1]

Digestibility and Nutritive Value. "The nutritive value of bread depends, not only on its chemical composition, but also on its digestibility, and digestibility in its turn seems to depend largely on the lightness of the loaf. It is the gluten in a dough which gives it the power of stretching and rising as the gas from the yeast expands within it, and

[1] From Farmer's Bulletin No. 389, U. S. Dept. of Agriculture, Washington, D. C. For further information, read "Bread and Bread-Making," Farmer's Bulletin No. 389.

hence of making a light loaf. Rye has less gluten proteids than wheat, while barley, oats and maize have none, so that they do not make a light, porous loaf like wheat. It is possible that of the various kinds of wheat flour those containing a large part of the bran — entire wheat and graham flours — furnish the body with more mineral matter than fine white flour; but it is not certain that the extra amount of mineral matter furnished is of the same value as that from the interior of the grain. They do not yield more digestible protein than the white flours, as was for a time supposed. It seems safe to say that, as far as is known, for a given amount of money, white flour yields the most actual nourishment with the various food ingredients in good proportion.

"It should be remembered, however, that all kinds of bread are wholesome if of good quality, and the use of several kinds is an easy means of securing variety in the diet."[1] As compared with most meats and vegetables, bread has practically no waste, and is very completely digested. Few foods yield so much energy for so little money. A diet of bread and milk can be perfectly balanced and will be tired of less easily than any other equally simple diet.

All bread-stuffs should be eaten slowly and thoroughly masticated, in order that time may be given for the saliva to act upon the starch. For if the stomach is hampered with quantities of unchanged starch it cannot perform its work without effort. Fermentation results or the intestines have more than their share of work to do and rebel. If these foods were eaten slowly much of the resultant dyspepsia would be avoided.

Gluten Bread. When, for any reason, persons are denied starch in the diet, as in diabetes, they find it a great privation to do without bread, and many attempts have been made to provide an acceptable substitute. Sometimes bran is used, or inulin or Iceland moss, but none of these is nutritious. One of the best materials for this purpose is gluten flour.

[1] From Farmer's Bulletin No. 389, U. S. Dept. of Agriculture, Washington, D. C.

It is prepared by washing the starch, wholly or in part, from wheat flour. The grayish, tough, elastic, sticky mass left after this process is largely gluten, and since gluten is a protein, it has been sometimes called "the lean meat of the vegetable kingdom." The washed gluten, dried and ground, is called gluten flour.

It still contains considerable starch, so that it is necessary for the physician to know the exact composition of the brand employed, to insure good results.

Gluten Standards. The necessity for a Standard for Gluten Flour is very apparent to chemists who have had occasion to analyze the various kinds on the market. For years millers have supplied dealers with middlings, entire wheat flour and mixtures containing bran to be sold as gluten flour. Ignorant of those facts, physicians advise their patients to use gluten, but, of course, have invariably been disappointed in results.

United States Standard for Gluten:

"Gluten Flour is the product made from flour by the removal of starch, and contains not less than five and six-tenths (5.6) per cent. of Nitrogen, and not more than ten (10) per cent. of Moisture."

Note.— Using the factor 6.25 usually employed by the U. S. Government chemists, Standard Gluten Flour must therefore show at least thirty-five (35) per cent. protein.

Bread-Making. The two practical methods of making bread are with yeast (fermented bread) and with cream of tartar and bicarbonate of soda (unfermented bread).

Fermented Bread. The raising or leavening of bread is usually brought about by allowing yeast to develop in it. Yeast is an exceedingly minute form of plant life, which, when given food, flour, moisture and warmth, grows; and by this growth produces carbon dioxide and alcohol.

The carbon dioxide, in its effort to escape, puffs up the flour dough, but owing to the viscous nature of the gluten (the elastic, strength-giving substances of flour) it is caught and retained.

Each little bubble of gas occupies a certain space, and when the bread is baked the walls around these spaces harden and the result is a porous loaf. The alcohol escapes into the oven in the baking.

To bake bread requires a hot oven.

The bread should continue to rise for about fifteen minutes after being placed in the oven, then the rising should cease and the loaf begin to brown.

We bake bread to kill the yeast plant, to render the starch soluble, to expel the alcohol and carbon dioxide and to form a nice flavored crust.

The making of good bread requires care and intelligence on the part of the cook. Use a good brand of flour, fresh yeast, remembering that yeast is a plant and must be put at a proper temperature to grow. Watch each process carefully.

" Lightness and sweetness of bread depends as much on the way in which it is made as on the materials used. The greatest care should be used in preparing and baking the dough and in cooking and keeping the finished bread."

Unfermented Bread. Carbon dioxide is obtained to lighten bread by causing cream of tartar and bicarbonate of soda to unite chemically.

To one part soda use two parts cream of tartar. When given moisture and heat carbon dioxide is obtained.

Baking powder is a combination of the following ingredients:

Bicarbonate of soda.................	84 grammes to
Cream of tartar......................	188 grammes
Starch	5 to 20 per cent.

WHITE FLOUR BREAD

1 slice (1 oz.) = 73 Calories.

1 pint hot milk (or water).	1 tablespoon salt.
1 pint cold milk (or water).	1 Fleischmann's yeast cake.
1 tablespoon sugar.	Flour (about 3 quarts).
2 tablespoons butter or lard.	

Into mixing bowl put the scalded milk, add the butter; when melted add the sugar, salt and cold milk. Save one-

half cup of this liquid, and when lukewarm soften the yeast in it and stand where it will keep warm. To above mixture add warmed sifted flour (sift twice before using) to make a thin batter, add softened yeast and more flour until stiff enough to knead. Knead until light and spongy. Care should be taken not to add more flour than is absolutely necessary. Butter a large stone crock or bowl, place bread in it and cover. Let rise three and one-half hours at about 75 degrees Fahrenheit (in a medium warm room). Then remove from jar and knead about twenty minutes until smooth and velvety, put into pans, cover carefully and let rise one hour or until double its bulk.

Bake in a hot oven from forty-five minutes to one hour, depending upon size of loaves.

If hard crust is desired, remove from pans and cool in a draft of air. For soft crust, before bread cools roll it in a clean cloth.

This quantity will make three good sized loaves; one-half the amount may be used for one large loaf.

ENTIRE WHEAT BREAD

1 slice (1 oz.) = 70 Calories.

2 cups scalded milk.
2 cups boiling water.
3 tablespoons butter.
3 tablespoons salt.
5 tablespoons molasses.
2 yeast cakes dissolved in ½ cup lukewarm water.
2 cups white flour.
Entire wheat flour enough to knead.

Make as for wheat flour bread, and add molasses after the first rising.

One-half of recipe may be used.

WHOLE WHEAT OR GRAHAM BREAD

Make the same as wheat flour bread, adding two tablespoons of sugar or molasses. Make a batter with white flour, using three or four cups, then use whole wheat or graham flour. Let rise longer than for white bread, and put immediately into pans without second kneading.

Note.— Omit sweetening if desired.

GLUTEN BREAD (FOR THE DIABETIC)

1 slice (1 oz.) = 71 Calories.

½ yeast cake.
2 cups lukewarm water.
3½ cups Gum Gluten Flour.
½ teaspoon salt.

Soften the yeast in a small portion of the water and add to the ingredients. Mix to a stiff dough and knead thoroughly, using more gluten if necessary to keep it from sticking to the board. Shape into a loaf, place in a buttered pan for about two and one-half hours to rise until the dough is about twice its bulk. Then bake for forty-five minutes. If desired the dough may be given a second mixing after the first rising, letting it rise again before baking.

Note.— Gum Gluten Bread may be made the same as ordinary wheat flour bread with the exception of shortening, which is not required.

Avoid having the water too warm or the bread will be sticky; the chill taken off is all that is necessary.

If desired, one cup of nut meats cut in small pieces may be added to dough just before putting into pans.

BRAN BREAD

Follow rule for Gluten Bread, using one part of bran to four parts of Gluten Flour with one cup of moisture. If the bran is increased the moisture must be lessened.

BOSTON BROWN BREAD, 2530 CALORIES

1 small slice (1 oz.) = 64 Calories.

1 cup granulated Indian meal.
1 cup rye flour.
1 cup graham flour.
1 teaspoon salt.
2 cups sour milk.
2 teaspoons soda.
¾ cup molasses.

Mix dry ingredients (except soda) together; dissolve soda in sour milk and add, then, molasses. Pour into buttered tins and steam three or four hours.

GLUTEN BISCUIT (FOR THE DIABETIC), 950 CALORIES[1]

1 cup Gum Gluten Self-raising.
1 tablespoon butter.
1 saltspoon salt.
Milk or water.

[1] Without milk.

Mix and sift dry ingredients, rub in the butter, add milk or water to make a soft dough. Roll and cut with biscuit cutter. Makes two large biscuits.

BRAN BISCUITS (FOR THE DIABETIC)[1]

Bran	50 gms.
Agar Agar (powdered)	5 gms.
Water	70 cc. (⅓ glass)

Tie bran in cheesecloth and wash under cold water tap until water is clear. Mix Agar Agar and ⅓ glass cold water free from lumps, and bring to a boil. Mix while hot with the washed bran. Turn the mixture onto a tray and press into a firm, even sheet about ¼ inch thick. Mark off into five biscuits, and when firm and cold (6 to 8 hrs.) bake in moderate oven till dry — about 45 minutes. Salt may be added. This quantity is sufficient for one day.

BAKING POWDER BISCUIT, 694 CALORIES

1 cup flour.
1½ level teaspoons Rumford baking powder.
¼ teaspoon salt.
1 tablespoon butter or lard.
½ cup (scant) milk or water.

Sift dry ingredients twice, rub in the butter with tips of fingers; using knife, stir in gradually the liquid; mix as soft as can be handled; put dough on a well-floured board, pat lightly to one inch thickness, cut with biscuit cutter, put on a shallow buttered tin, heated, and bake in a hot oven. Put a little milk on top of each biscuit before baking to make them brown well.

Note.— Dough may be lightly kneaded as for bread, and then cut.

BRAN CAKES FOR DIABETICS, 393 CALORIES[2]

		Calories
Bran	2 cups	
Melted butter	30 grams (1 tablespoonful plus 2 gms.)	225
Eggs (whole)	2	156
Egg-white (1)	25 grams	12
Salt	1 teaspoonful	
Water		

1 Dr. F. M. Allen, "The Hospital of the Rockefeller Institute," 1917. (Agar Agar purchase at drug stores. Bran is more reasonable if purchased from a feed store.)

2 Dr. Elliott P. Joslin, "The Treatment of Diabetes Mellitus." Lea & Febiger. Philadelphia, Pa., 1916.

Tie bran in cheese-cloth and wash thoroughly by fastening on to the water tap, until the water comes away clear. The bran should be frequently kneaded so that all parts come in contact with the water. Wring dry. Mix bran, well beaten whole eggs, butter and salt. Beat the egg white very stiff and fold in at the last. Shape with knife and tablespoon into three dozen small cakes. If desired one-half a gram of cinnamon or other flavoring may be added. Each cake contains: protein, 0.5 grams; fat, 1.0 gram; calories, 11.

WHITE GEMS, 1627 CALORIES

2 cups flour.
1 teaspoon salt.
3 level teaspoons Rumford baking powder.
2 tablespoons butter.
2 tablespoons sugar.
2 eggs.
1 cup milk.

Sift dry ingredients into mixing bowl, add butter and rub it in with tips of fingers. Add the well-beaten eggs and the milk gradually and beat all well together. Have gem pans well greased and heated; fill two-thirds full and bake in a very hot oven fifteen or twenty minutes. Put a little melted butter on each gem before putting it into the oven. They are sufficiently cooked when tested with a fine washed knitting needle and it comes out dry.

CORNMEAL GEMS, 1370 CALORIES

1 cup flour.
½ cup cornmeal.
⅓ cup sugar.
3 level teaspoons Rumford baking powder.
½ teaspoon salt.
1 egg.
1 cup milk.
1 tablespoon melted butter.

Sift dry ingredients into mixing bowl, add the milk and well-beaten egg and the melted butter. Put into well-greased hot gems and cook in a quick oven.

POP-OVERS, 730 CALORIES

1 egg.
1 cup milk.
Speck salt.
1 cup flour.

Beat egg until very light, add milk and salt and sift in the flour very carefully — beat very light, never stirring. Have ready gem pans or stone custard cups, well greased and heated. Pour in mixture, filling two-thirds full, and bake in quick oven. This will make six large pop-overs. The success of these pop-overs lies in beating the batter well and in having the cups very hot before putting in the mixture.

Note.— These cannot be cooked successfully in tin.

BUTTER BALLS

1 teaspoon butter = 36 Calories.

Cut butter in small pieces size of balls desired, and put in ice-water. Soak the butter paddles in boiling water ten minutes, then chill in ice-water. Hold a paddle firmly in the left hand and roll each piece of butter with the right paddle until round. If butter sticks it must be chilled longer, or paddles must be rubbed with salt and reheated.

One pound of butter will make about thirty balls.

TOAST

In ordinary wheat bread, starch is the principal constituent. Starch when subjected to a high degree of heat is changed into an easily digested substance called dextrin.

In the ordinary cooking of a loaf of bread the starch, in the outer layer is changed into dextrin, which gives the crust its sweet flavor. Slices of bread toasted undergo a similar change.

Bread is toasted not merely to brown it, but to take out all the moisture possible, so that it may be more thoroughly moistened with the saliva, and thus easily digested; also to give it a better flavor. The correct way to make toast is to use stale bread cut in uniform slices, and to dry it thoroughly before browning.

Toast prepared in this way, even if moistened with milk or water, may be easily and thoroughly acted upon by the digestive fluids.

ENERGY VALUE OF BREAD

1 slice (1 oz.) white bread	=73 Calories.
1 slice (1 oz.) entire wheat bread	=70 Calories.
1 slice (1 oz.) gluten bread	=71 Calories.
1 small slice (1 oz.) Boston Brown Bread	=64 Calories.

See Table, page 64, for energy value of other ingredients.

SIPPETS

Cut thin slices of bread, and from them make oblongs an inch wide by four inches long. Toast carefully so that they will not break, and pile on a small bread-plate with doily if they are to be served dry.

TOAST STICKS

Take a slice of fresh home-made bread (made without shortening), or French bread, cut five-eighths of an inch thick, remove crust and cut in narrow strips. Place on rack in pan and dry and brown in a slow oven.

CROUTONS

See chapter "Soup Accompaniments" for recipe. Page 230.

GLUTEN CRISP (FOR THE DIABETIC)

Cut Gum Gluten Bread into thin slices, and dry in slow oven until the moistening is thoroughly evaporated, or the bread may be cut in cubes and slightly browned. Serve in soups or in milk.

Note.— Gluten Biscuit Crisps, page 261.

WATER TOAST

Toast the bread. Dip quickly in boiling salted water (allowing one-half teaspoon salt to one cup water). Spread with butter. Serve on hot plate.

TOASTED CRACKERS

1 Saltine = 15 Calories.

Toast oblong crackers daintily, and butter. Serve on plate with doily, piled log-cabin fashion.

MILK TOAST, 388 CALORIES

Put a cup of rich milk in a saucepan and place it on the stove. While it is heating, toast three slices of bread to a delicate brown. Put them into a covered dish, and when the milk is scalding hot, season it with a saltspoon of salt, and pour it over the toast.

Note.— A little butter may be spread on each slice before the milk is added, but it is a more delicate dish without it.

CREAM TOAST NO. I, 261 CALORIES

(Individual Rule.)

½ tablespoon butter.	½ cup milk.
½ tablespoon flour.	1½ slices bread.
½ saltspoon salt.	

Scald the milk. Melt butter, add flour, remove from fire and add the milk gradually. Stir over heat constantly until smooth, cooking five minutes after blending, or until the starch is thoroughly cooked.

Toast: Remove crust if desired, cut in oblong pieces and toast. Serve on small platter with cream sauce poured over it, and garnish with toast points.

Note.— If you wish the toast very soft, it may be dipped very quickly in boiling salted water before adding the cream sauce.

CREAM TOAST NO. II, 261 CALORIES

½ tablespoon butter.	1 tablespoon cold water.
½ tablespoon flour.	½ cup milk.
½ saltspoon salt.	1½ slices toast.

Scald milk. Mix flour and salt and add the cold water gradually, making a smooth, thin paste. Add to scalded milk; cook in double boiler twenty minutes, stirring constantly until it thickens. Add butter. Pour over toast, and serve hot, on hot platter.

CELERY TOAST

4 ounces celery = 12 Calories.

Clean celery and cut into one-inch pieces; cover with boiling water and cook until tender; drain off water.

Prepare Cream Sauce in Cream Toast No. I; add cooked celery and pour on small slices of buttered toast. Garnish with toast points.

FRENCH TOAST (FOR THE DIABETIC), 144 CALORIES [1]

½ cup milk.	Salt.
1 egg.	Gluten bread.

Beat the egg, add milk and salt; dip into this mixture slices of Gum Gluten bread. Sauté and brown in a little butter.

CLAM BROTH AND TOAST

Follow directions as for Milk or Cream Toast, adding sufficient Clam Broth (to taste) to the Sauce, and pour over toast. Serve hot.

SANDWICHES

TO PREPARE SANDWICHES

Use white, entire wheat, graham, gluten or Boston brown bread. Bread may be buttered before cutting from loaf, spread with soft, plain butter cut into very thin slices, cover with another slice, press together, cut in fancy shapes, or roll. Wrap in waxed paper or cover with a dry napkin, over which place a slightly moistened one, until ready to serve.

Bread may be baked purposely for sandwiches by filling one-half pound baking powder boxes half full of dough, let rise and bake. Serve sandwiches on a dainty doily on a small plate.

ENERGY VALUE OF BREAD

1 slice (1 oz.) white bread	=73 Calories.
1 slice (1 oz.) entire wheat bread	=70 Calories.
1 slice (1 oz.) gluten bread	=71 Calories.
1 small slice (1 oz.) Boston Brown Bread	=64 Calories.
1 teaspoon butter	=36 Calories.

See Table, page 64, for energy value of other ingredients.

[1] Calculated without bread.

BREAD AND BUTTER SANDWICHES

Butter bread slightly, cut very thin and put slices together. Cut in fancy shapes.

BOSTON BROWN BREAD SANDWICHES

Steam Boston brown bread in one-half pound baking powder cans. Butter and cut in thin slices and add a thin round of white bread. The combination of the two makes a pleasing variety.

CHEESE SANDWICHES

Chop stuffed olives fine and add equal quantity of cream cheese and spread on bread and butter sandwiches. A lettuce leaf may be added if desired.

CHICKEN SANDWICHES

Chop cold boiled chicken, add mayonnaise dressing and spread on bread and butter sandwiches.

Or, instead of mayonnaise, moisten with strong chicken broth and season with salt and pepper. Minced celery may be added.

EGG SANDWICHES

See chapter "Eggs" for recipe. Page 183.

FRUIT SANDWICHES

Spread bread and butter sandwiches with stewed dates, figs or prunes, seasoned with a little lemon juice or chop dates, raisins and nuts very fine and moisten with "Cream Dressing." See page 274.

LETTUCE SANDWICHES

Spread bread and butter sandwiches with a little mayonnaise dressing, lay in fresh, crisp lettuce leaves washed and dried thoroughly, and cut even.

NUT SANDWICHES

Prepare same as lettuce sandwiches, adding chopped nuts to the mayonnaise.

PEPTONOIDS SANDWICHES

Cut slices of bread in fancy shapes, butter and spread with layer of Dry Peptonoids Soluble, adding salt, pepper, paprika or celery salt, if desired.

Note.— Dry Peptonoids Soluble may be blended with mayonnaise dressing, cream, chopped nuts or eggs, for filling.

RAW BEEF SANDWICHES

See chapter "Beef Preparations" for recipe. Page 217.

DATE SANDWICHES

Combine chopped Dromedary Dates with chopped pecan nut meats or cottage cheese and spread on slices of wheatbread, which have been spread with thick, sweet cream or soft butter.

CRACKERS — WAFERS

BRAN CRACKERS, 1513 CALORIES[1]

1½ cups wheat bran.
1½ cups sifted flour.
1 teaspoon cream of tartar.
½ teaspoon soda.
½ teaspoon salt.
4 tablespoons butter.
Milk.

Blend all ingredients, using enough cold milk to make a stiff dough. Roll to one-eighth inch thickness and cut with a small biscuit cutter. Great care is needed in baking that they do not burn and at the same time that they are thoroughly cooked.

They keep well a long time if put in a tin box.

They should be eaten at each meal if needed as purgative medicine.

DELICIOUS CRACKERS, 547 CALORIES

White of one egg.
Pinch of salt.
¾ cup stoned Dromedary Dates, chopped.

Beat slightly the white of egg with salt. Add the chopped dates, spread on unsweetened crackers, pressing down firmly, and put in moderate oven for three minutes. This is a delicious cracker, particularly suitable for small children.

GLUTEN WAFERS (FOR THE DIABETIC)

½ cup thick cream = 432 Calories.
1 saltspoon salt.
Gum Gluten Flour (1 cup = 513 Calories).

Add salt to the cream and add the Gluten gradually to make a stiff dough. Toss on a floured board and roll as thinly as possible and cut in strips with sharp knife or shape with a cutter. Bake in a buttered sheet in a slow oven until delicately browned.

GLUTEN BISCUIT CRISPS (FOR THE DIABETIC)

1 biscuit crisp = 25 Calories.

Gum Gluten Biscuit Crisps may be served plain, or buttered and heated slightly in oven.

GLUTEN CHEESE WAFERS (FOR THE DIABETIC), 882 CALORIES

1 cup Gum Gluten Flour.
3 tablespoons cream.
3 tablespoons grated cheese.
Yolks 2 eggs.
1 saltspoon salt.
Nutmeg.

Mix in order given, roll thin and bake.

VEGETABLES — VEGETABLE SAUCES

LEGUMES — ROOTS AND TUBERS — GREEN VEGETABLES

Vegetables include nearly all kinds of plant food except fruits, grains and nuts.

Classification. Vegetables are classified as —

Legumes — as peas, beans and lentils.
Roots and Tubers — as potatoes, beets, turnips, etc.
Green Vegetables — as lettuce, spinach, celery, etc.

Composition. All vegetables have a high percentage of water, and with the exception of legumes, a relatively small proportion of protein. The chief nutrients are starch and

sugar. The fats are usually small in amount and chiefly in the form of oils. A variety of mineral salts are present, chiefly salts of potash and soda united with organic acids. Vegetables give bulk to food and possess antiscorbutic properties.

Digestibility. As the gastric ferments play no part in carbohydrate digestion, vegetables are digested mainly in the intestines. The presence of cellulose prevents the ready digestion of the nutrients, hence it may be stated as a general rule that vegetable food is less completely digested and absorbed than animal food. It would seem desirable to restrict this type of food for persons of very weak digestive powers.

General Rules for Cooking Vegetables. Wash thoroughly; pare, peel, or scrape, according to the kind. Let them stand in cold water until ready to cook, to keep them crisp, to freshen them when wilted, or to prevent them from turning dark.

Cook in enough freshly boiling salted water to cover, and keep the water boiling (not rapid boiling, as tender vegetables are easily broken). Allow one teaspoon of salt to one quart of water. Salt may be added when vegetables are put in, except in the case of delicate green vegetables, as peas, spinach, etc., when it should not be added until nearly done. To preserve the color, cook green vegetables uncovered.

Vegetables should be cooked only until tender, drained immediately, and served promptly. Overcooking injures their flavor and makes them tough. Time for cooking vegetables varies with the size, age and freshness.

Thrice-cooked Vegetables.[1]—The vegetables are cleaned, cut up fine, soaked in cold water and then strained. The vegetables are then tied up loosely in a large square of double cheese-cloth — large enough so that the corners of the cloth, after it has been tied up with a string, make conveniently long ends, and also large enough to allow the vegetables to swell without sticking together. They are then transferred to fresh cold water, placed on the fire, and allowed to reach 150° F. This water is poured off and replaced by water of the same temperature, which is brought to the boiling point, and then

1 Dr. Elliott P. Joslin, "The Treatment of Diabetes Mellitus."

the water is again poured off, and so on until the requisite number of changes are made. The pots for the vegetables should be of sufficient size to hold a large quantity of water, and in a hospital, vegetables enough for the daily supply of six patients. Vegetables thus cooked will keep in cold storage two or more days, and can be reheated in a steamer.

If the vegetables are cooked with the cover left off the pot they will be lighter in color and the flavor not so strong.

Legumes. Of this class of food-stuffs, peas and beans are the most important. Lentils and peanuts are also valuable.

Composition. Fresh legumes, such as peas and beans, contain from 2 per cent. to 9 per cent. of protein, a trace of fat and from 7 per cent. to 30 per cent. of carbohydrate.

Dried legumes, such as dried peas and beans, on account of the lessened amount of water, contain from 18 per cent. to 35 per cent. of protein, over 1 per cent. fat, and as high as 65 per cent. carbohydrate. They form one of the chief sources of protein in a strictly vegetarian diet. Digestibility depends largely upon the method of cooking and the amount eaten.

Roots and Tubers. Roots and tubers contain the reserve material stored up by the plant, and some of them are among the important food-stuffs. Their nutritive value is largely due to starch and sugar. On account of the small proportion of protein and fat, and the large proportion of water, they are inferior in nutritive value to both legumes and cereals. The mineral matter is an important constituent of these, as of other vegetable foods. Sodium, potassium and iron salts, and sulphur and phosphorus compounds, are the common ash constituents. In combination with organic acids, etc., they contribute much to the flavor of these foods.

As a class they may be divided into the following groups:

1. Starch-yielding vegetables, as potatoes and sweet potatoes.

2. Succulent roots, as beets, carrots, parsnips and onions.

3. Condimental or flavoring roots, as horse-radish and ginger.

The potato is the most important of the starch-yielding class of vegetables. It is a tuber or thickened underground stem.

The composition of the potato (Letheby) is as follows:

Water	75.00 per cent.
Starch	18.80 per cent.
Nitrogenous matter	2.00 per cent.
Sugar	3.00 per cent.
Fat	.20 per cent.

When pared before cooking, there may be a considerable loss of nutritive material, especially of mineral matter. By cooking in the skin, this loss is largely prevented. To be easily digestible, a potato must be mealy, so as to be readily acted on by digestive juices. This is best accomplished by baking in an oven at 380 to 400° F. When a patient begins to take solids, the vegetable usually first prescribed is a baked potato.

Beets, carrots, parsnips, salsify, turnips and onions are the most common of the class of succulent roots. They contain, as a rule, more water than the starch-yielding class of vegetables, and their carbohydrates are frequently in the form of sugars, pectins, and other polysaccharide carbohydrates than true starch, some of which have no nutritive value. The percentage of crude fiber is greater than in the starch-yielding class.

The characteristic flavors and odors are in many cases due to the presence of volatile organic compounds of sulphur. These are often advantageous in making the vegetables palatable, and adding variety to the diet.

The beet contains a large percentage of starch and sugar.

Carrots and parsnips also contain much sugar, and when young and tender form a very nutritious food.

Onions contain considerable nutriment, but are most valuable for their pungent oil, which is rich in sulphur. They have diuretic properties, and are useful in constipation.

Radishes contain a large amount of cellulose and should not be eaten by invalids. They are chiefly used as a relish.

Green Vegetables. These vegetables have a fuel value of less than 200 calories per pound; they are useful chiefly for their mineral salts, and for the bulk, variety and relish they give to the diet.

Asparagus is easily digested, even by invalids. It has a diuretic action, and imparts a characteristic odor to the urine for some hours.

Cabbage contains considerable sulphur and therefore frequently causes flatulence.

Cauliflower belongs to the cabbage family, but is easily digested.

Celery is more digestible cooked than raw.

Spinach is especially valuable for its large amount of iron.

ENERGY VALUE OF THE POTATO

1 medium potato (3½ ozs.) = 83 Calories.

See Table, page 64, for energy value of other ingredients.

BOILED POTATOES

Select potatoes of uniform size. Wash, pare and put into cold water to keep from discoloring. Put them into saucepan, cover with boiling water, boil and when partly cooked, add one tablespoon salt to every six potatoes. Cook until soft, about twenty-five to thirty minutes, drain very dry, and shake the pan, without a cover, gently over the stove till the potatoes are mealy. Do not serve in covered dish.

RICED POTATOES

Add salt and pepper to boiled potatoes, and rub them through a heated potato-ricer or squash-strainer into the (hot) dish they are to be served in. Serve immediately, or pour a little milk over the top and brown in the oven.

MASHED POTATOES, 305 CALORIES

For mashed potatoes the uneven sizes may be used; the larger ones should be cut, so all will be of uniform size. Prepare as for boiled potatoes. When cooked and dried, add salt, butter, pepper and cream in following proportion:

1 pint potatoes.
½ teaspoon salt.
1 tablespoon butter.
½ saltspoon white pepper.
2 teaspoons hot cream or milk.

To the potatoes add the salt, pepper and butter, and mash, leaving them in saucepan cooked in, and on stove so as to keep them hot. Use open-wire masher or fork and beat quickly, so they may be light and dry, not "gummy." Lastly put in the cream, beat for a moment and serve immediately.

POTATO CAKES

From cold mashed potatoes make slightly flattened balls. Put them in a floured tin, brush each over with milk and bake in a hot oven five minutes, or till a delicate brown.

Note.— These cakes may be sautéed in a little beef fat or butter if desired.

SURPRISE BALLS

Roll the potatoes into balls as above, and with a teaspoon press a hollow in the top. Chop fine some cold, lean meat, season it with salt, pepper and gravy and put one teaspoon of the meat into the hollow of the potato ball. Put a little milk or melted butter on top and brown in oven or sauté.

BAKED POTATOES

Select potatoes of uniform size, not very large, wash and scrub thoroughly, cut off a small piece at each end in order that the steam may escape. Bake in *hot* oven from forty-five to fifty minutes. When baked break open slightly, that steam may escape, and serve on folded napkin.

POTATOES BAKED IN THE HALF SHELL

Cut off top of baked potato and scoop out inside. Mash and season well as for mashed potatoes and add the well-beaten white of egg. Fill the skins with the mixture, heaping it lightly on top, brush over with milk or slightly beaten white of egg and brown slightly. Potatoes may be sprinkled with grated cheese before putting into oven.

POTATOES AU GRATIN

Cut cold boiled potatoes into cubes and put into a buttered baking dish. Cover with white sauce, put buttered cracker or bread crumbs on top and bake until golden brown.

Note.— A little grated cheese added to the White Sauce just before pouring over the potatoes adds a pleasant flavor.

CREAMED POTATOES, 180 CALORIES

1 cup cold sliced or cubed potatoes.
¼ cup milk.
½ tablespoon butter.
¼ teaspoon salt.
½ teaspoon finely chopped parsley.
Speck white pepper.

Heat the milk, add the potatoes, and cook until they have nearly absorbed the milk. Add butter and seasoning, cook five minutes longer, add parsley and serve hot.

POTATO BALLS

From large potatoes cut balls with a French potato cutter and throw them into cold water. Cook for twelve minutes or more in enough boiling water to cover. Salt at end of six minutes. Drain and let them stand a few minutes to dry. Serve as a vegetable, with cream sauce, or with parsley butter, or use as a garnish for broiled fish. Test potatoes with a needle to see when tender.

Note.— Make mashed potatoes from frames left after cutting out the balls.

PARSLEY BUTTER, 358 CALORIES

1 tablespoon butter.
1 teaspoon chopped parsley.
Juice ½ lemon.
1 pint potato balls.

Cream the butter, add lemon juice and chopped parsley. Add to the hot potato balls, heat five minutes and serve. Omit lemon juice if desired.

ASPARAGUS

¼ bunch asparagus.................. =60 Calories.
1 slice toast (1 oz.).................. =73 Calories.

Boiled Asparagus. Prepare asparagus by cutting off lower part of stalk at the point at which they will snap. Wash,

remove scales and tie together or cut into one inch pieces Cook in boiling salted water until soft, twenty to thirty-five minutes. As the tips are more tender keep them out of water the first ten minutes of the cooking. Drain, place in hot serving dish, spread with one-half teaspoon butter and sprinkle with salt.

Asparagus on Toast. Serve boiled asparagus on buttered toast, moistened with a little of the liquid the asparagus is cooked in.

Cream Asparagus, Plain or on Toast. Pour Cream Sauce No. I over boiled asparagus and serve hot, or serve boiled asparagus on toast and pour Cream Sauce No. I over same.

CARROTS

1 small carrot (2 ozs.) = 20 Calories.

Boiled Carrots. Wash, scrub and scrape off the very thin skin. Cut each carrot into slices from one-fourth to one-fifth inch thick, cut into cubes and cook in boiling salted water until soft, forty-five to sixty minutes. They may be served plain with a little melted butter, salt and pepper, or they may be mashed and seasoned as above.

Creamed Carrots. Pour Creamed Sauce No. I over boiled cubed carrot, reheat and serve.

CAULIFLOWER

1 serving (4 ozs.) = 35 Calories.

Boiled Cauliflower. Cut off stalk and remove leaves of cauliflower. Soak thirty minutes in cold water to cover, head down. Cook, head up, twenty to thirty minutes, or until soft, in boiling salted water. Drain and separate flowerets.

Creamed Cauliflower. Pour Cream Sauce No. I over boiled cauliflower, reheat and serve.

CELERY

1 serving (2 ozs.) = 6 Calories.

Scrape celery. Cut stalks in one-half inch pieces and cook uncovered in boiling salted water twenty to thirty minutes. Serve with Cream Sauce No. I poured over it. Sauce

can be made using part milk and part water in which celery was cooked.

SPINACH — DANDELIONS — BEET GREENS

1 serving (4 ozs.) = 27 Calories.

Remove roots, pick over carefully (discarding wilted leaves) and wash *thoroughly* in many waters until free from sand; cook in boiling salted water, allowing one-fourth as much water as greens. Cook twenty-five to thirty minutes. Drain and chop if desired, reheat, season with butter and salt; garnish with slices of hard-cooked egg. Serve with vinegar.

ONIONS

1 serving (4 ozs.) = 56 Calories.

Boiled Onions. Put onions into pan of cold water and peel under water. Put them into boiling water with one teaspoon salt and one-fourth teaspoon soda to one quart water. After cooking five minutes pour off the water and add fresh boiling salted water, and after ten minutes change the water again. Boil until tender — forty-five to sixty minutes. Drain off the water and add a little milk, cook a few moments and add butter, salt and pepper.

Creamed Onions. Pour Cream Sauce No. I over boiled onions, reheat and serve.

Scalloped Onions. Place onions in a baking dish and add Cream Sauce No. I. Cover top with buttered cracker or bread crumbs and bake until crumbs are a golden brown.

PEAS (GREEN OR CANNED)

1 serving (4 ozs.) = 114 Calories.

Green Peas. Remove peas from pods, cover with cold water and let stand one-half hour. Skim off small peas that come to the top and drain remaining peas. Cook until soft, thirty to forty-five minutes, in a small quantity of water. There should be little or no water to drain from peas when they are cooked. A small quantity of sugar may be added if the natural sweetness of the peas has been lost. Season with butter and salt.

Canned Peas should be drained and thoroughly rinsed, cover with boiling water, boil two minutes and again drain, then add a small quantity of boiling water and cook from five to ten minutes. Season with butter, salt and pepper.

Creamed Peas No. I. To one-third cup of cooked peas add one teaspoon of flour mixed with one-eighth teaspoon of sugar. Cook slightly and add one tablespoon of cream, and salt and pepper to taste. = 75 calories.

Creamed Peas No. II. Pour Cream Sauce No. I over drained cooked peas, reheat and serve.

STRING BEANS

1 serving (4 ozs.) = 44 Calories.

Remove strings from beans and cut or snap into one inch pieces. Wash and cook in boiling water until tender (one to three hours). Drain and season with butter and salt. Cook beans in as little water as possible. Select fresh beans that will snap easily.

STEWED TOMATOES

1 medium tomato .... = 16 Calories.
1 cup canned tomato.................. = 51 Calories.

Canned or fresh tomatoes may be used. To prepare fresh tomatoes wash, pour boiling water over them and then peel and cut into pieces, put in saucepan and cook slowly twenty minutes, stirring occasionally. Add a few bread or cracker crumbs and season with butter, salt and pepper. Bread and cracker crumbs may be omitted. A little sugar may be added if tomatoes are very acid.

BAKED TOMATOES

1 medium tomato = 16 Calories.

Wash, dry and remove a thin slice from stem end of tomato. Remove seeds and pulp, and drain off most of the liquid; to the pulp add an equal quantity of cracker crumbs, season with salt and pepper and a little chopped onion, or a few drops of onion juice. Refill tomatoes with mixture and

place in a buttered tin; sprinkle with buttered cracker crumbs, bake twenty to thirty minutes in a hot oven.

SCALLOPED TOMATOES (FOR THE DIABETIC), 165 CALORIES

(Individual Rule.)

1 large ripe tomato.	3 Gum Gluten Biscuit Crisps.
Salt, pepper.	2 teaspoons butter.

Into a well-buttered individual baking dish place one crushed Biscuit Crisp; and place on top of this one-half the tomato, from which the skin has been removed and then cut in small pieces; season well with salt, pepper and bits of butter. Add another layer of crumbs (one crushed Biscuit Crisp), then the remaining tomato and seasoning, lastly crumbs. Place bits of butter on top, put in slow oven and bake twenty to thirty minutes.

VEGETABLE SAUCES

CREAM OR WHITE SAUCE NO. I, 152 CALORIES [1]

Use to pour over any vegetable.

(Individual Rule.)

½ cup milk or thin cream.	¼ saltspoon salt.
½ tablespoon butter.	Speck white pepper.
½ tablespoon flour.	

Scald the milk. Melt the butter in a saucepan, remove from stove, add the flour, then the scalding milk gradually, put over heat and cook, stirring constantly, until smooth and there is no raw taste of starch.

This sauce may be used in many ways — with creamed oysters, sweetbreads, any cream dish or any scalloped dish. If a thick sauce is desired, use one tablespoon of flour in place of one-half.

CREAM SAUCE NO. II, 134 CALORIES

(Individual Rule.)

½ cup milk or thin cream.	1 teaspoon butter.
½ tablespoon flour.	⅛ teaspoon salt.

[1] Calculated with milk.

Scald the cream. Wet the flour with a little cold milk to make a smooth mixture, and add to the hot cream. Cook well. Just before serving add the butter and salt, and pepper if desired.

Sauce blended in this way is especially easy of digestion. If a thick sauce is desired, use one tablespoon of flour in place of one-half.

SALADS AND SALAD DRESSINGS

The salad plants, such as lettuce, celery, water cress, endives, etc., contain little nutriment, but are especially rich in mineral matter, and served uncooked in the form of salad, all this mineral matter is preserved. They are very valuable, as these mineral substances are necessary for the healthy condition of the blood and should form a large part of the daily diet.

Salads should not be eaten by dyspeptics or those having delicate bowels.

Salads should be prepared daintily, arranged attractively and always be served cold. Lettuce and other salad plants should be fresh, crisp, and dry. Wash thoroughly, on account of danger of germs from dust, soil, etc., chill in very cold water until crisp and dry by placing on a clean towel so that the water will drain from the leaves; or fold lightly in a towel and place on ice until serving time. Parsley is revived quickly by sprinkling with cold water and putting it into an air-tight fruit jar and keeping it in a cold place. Treated in this way it will keep fresh a long time.

Dressing should not be added to green vegetables until just before serving, as it tends to wilt them.

Meat to be used in salads should be free from skin and gristle, and should be cut into small cubes, mixed with French dressing and allowed to stand some time before combining with the vegetables.

A dainty salad served with a crisp cracker or cheese wafer

forms an acceptable luncheon for the convalescent. It may also be served with dinner.

FRENCH DRESSING, 270 CALORIES

(Individual Rule, ⅓ of Recipe.)

1 tablespoon vinegar.	⅓ teaspoon salt.
2 tablespoons Nicelle olive oil.	½ saltspoon pepper.

Mix all ingredients thoroughly and pour over salad just before serving.

BOILED DRESSING, 483 CALORIES

(Individual Rule, ½ of Recipe.)

1 teaspoon salt.	1 egg.
½ teaspoon mustard.	½ cup milk.
Speck cayenne.	2 tablespoons butter.
2 tablespoons sugar.	¼ cup vinegar.

Mix all dry ingredients. Beat egg in double boiler, add dry ingredients, butter and milk; cook over hot water, stirring constantly until thick like custard; add vinegar; cool and serve.

Note.— If it curdles, beat over cold water until smooth.

MAYONNAISE DRESSING, 2570 CALORIES

(Individual Rule, ¼ of Recipe.)

1 teaspoon mustard.	Yolks 2 eggs.
2 teaspoons powdered sugar.	1½ cups Nicelle olive oil.
1 teaspoon salt.	2 tablespoons vinegar.
Speck cayenne.	2 tablespoons lemon juice.

Mix dry ingredients, add to yolks and mix thoroughly. Add a few drops of oil at a time until one-half cup is used, beating with egg-beater or wooden spoon. Then add alternately a few drops of vinegar and lemon juice and the remainder of the oil, using care not to lose the stiff consistency. It should be a thick dressing and not added to food until just before serving.

Note.— Have all ingredients and utensils thoroughly chilled and place mixing bowl in a pan of crushed ice while blending.

If dressing curdles, take another egg yolk and add the curdled mixture to it slowly, beating constantly.

Note.— One-half or one-fourth of recipe may be prepared. As it will keep well it is best to prepare in larger quantity, thus saving labor.

CREAM DRESSING, 1697 CALORIES

(For Fruit Salads.)

½ cup butter.	1 teaspoon mustard.
2 tablespoons flour.	1 tablespoon cider vinegar.
1 cup scalded milk.	1 teaspoon salt.
3 yolks of eggs.	½ cup vinegar.
3 whites of eggs.	½ cup sugar.

(*a*) Melt butter in a saucepan, add flour and pour on gradually the scalding milk, cook thoroughly, stirring constantly. (*b*) Beat yolks in top of double boiler, add the mustard (dissolved in one tablespoon of vinegar), salt and vinegar. Pour (*a*) gradually on the egg mixture and cook over hot water until it thickens like soft custard, remove from fire, add the sugar and fold in the stiffly-beaten white of eggs. Pour into glass fruit jar, cool and cover and keep on ice. This dressing will keep a long time and is especially delicious to serve with fruit salads.

CHICKEN SALAD, 856 CALORIES

(Six Servings.)

2 cups cut chicken.	½ saltspoon pepper.
1 cup cut celery.	1 tablespoon vinegar.
2 tablespoons Nicelle olive oil.	2 tablespoons mayonnaise.
1 saltspoon salt.	

Mayonnaise, olives, celery leaves or white lettuce for garnishing.

Cut the cold chicken into small dice; cut the cleaned celery into small uniform pieces. Mix these together and pour over the oil. Mix well, then sprinkle with salt and pepper to taste; add the vinegar, blend and put in colander to drain; set in a cold place for two or three hours. Just before serving add the mayonnaise, put on a bed of lettuce and garnish.

Note.— Do not mince chicken.

FRUIT SALADS

Any combination of fruit desired may be used served with "Cream Dressing." An attractive combination is a banana peeled, cut in half crosswise. Cut one-half lengthwise, arrange on lettuce leaf, add a little Cream Dressing and garnish with malaga grapes (cut in half and seeded) and small pieces of English walnuts.

MARGUERITE SALAD

One hard-cooked egg cut crosswise. Remove yolk. Cut white in slices, petal fashion, arrange on lettuce leaf like a marguerite and fill the center with the yolk put through the potato-ricer or strainer. Garnish with parsley and serve with French, boiled or mayonnaise dressing.

MIXED SALAD

Equal proportions of green peas (cooked and drained), celery cut in thin slices and English walnuts cut into small pieces. Season with salt and pepper, add mayonnaise and serve on lettuce leaves. Garnish with ripe cherries on the stem with blanched hazel nuts put in place of stones.

SWEETBREAD SALAD

Mix equal parts of parboiled sweetbreads cut into one-half inch cubes and celery cut into thin slices. Season with salt and moisten with mayonnaise dressing. Arrange daintily on lettuce leaves.

ORANGE AND DATE SALAD, 1373 CALORIES

Separate one package Dromedary Dates, cover with boiling water and cook for two or three minutes. Drain, and dry in an oven, cool, stone and cut in halves lengthwise. Halve four large oranges and cut out the sections of pulp. Arrange crisp lettuce leaves on a platter, pile the orange in the centre and surround with the dates. Serve with French dressing.

WALDORF SALAD

Mix equal parts of apples, pared and cut into small cubes, celery sliced in thin circles and English walnuts cut into

small pieces. Season with salt and moisten with mayonnaise. Serve on lettuce leaf, garnished with a spoonful of whipped cream and halves of English walnuts or pecans.

WATER LILY SALAD

One hard-cooked egg. Cut in halves crosswise in fence fashion; remove yolk, put through strainer and refill white. Serve on shredded lettuce leaves and garnish with parsley. Serve with French, boiled or mayonnaise dressing.

CHEESE WAFERS

Butter wafer crackers and sprinkle thickly with grated cheese. Put in oven and bake till cheese is melted and crackers are a delicate brown. Arrange on small plate with doily. Serve with salad.

CHEESE GLUTEN BISCUIT CRISPS (FOR THE DIABETIC)

Put grated cheese on Gum Gluten Biscuit Crisps, place in moderate oven until the cheese is melted. Serve while hot. Gum Gluten Biscuit Crisps may be spread with cream cheese and served with salad.

FRUITS[1]

Fruits are the seed-bearing portions of plants. Some products of this class, such as melons, are sometimes called fruits and sometimes vegetables; and a few vegetable products which are not fruits in the strict sense, are included in this class of food products because they have a similar place in the diet.

Composition. Fresh fruits contain a high percentage of water, varying from about 75 per cent. to over 95 per cent. It has been suggested that those containing 80 per cent. or more of water be classed as flavor fruits, and those with less than 80 per cent. as food fruits: Bananas, grapes and fresh figs are the commonest examples of the latter class. When the water is removed by evaporation, as in drying, the per-

[1] For further information, note "Uses of Fruit as Food." Farmer's Bulletin No. 293, U. S. Dept. of Agriculture, Washington, D. C.

centage of moisture falls to 30 per cent. or less, and the proportion of nutrients is correspondingly raised, so that dried fruits would fall into the class of food fruits. Preserved fruits have their nutritive value raised by the addition of water, and usually by some loss of water in preparation.

As a class, fruits contain little or no fat. The olive is a remarkable exception.

The proportion of protein is so low as to be practically negligible.

Carbohydrates are the chief nutrient present. In ripe fruits these are almost wholly in the form of sugars and other soluble carbohydrates, commonly called pectin bodies. In unripe fruits starch is often found — notably in the ordinary banana. The principal sugars are sucrose or cane sugar, dextrose or grape sugar, and levulose or fruit sugar. A mixture of the last two is common, and is called invert sugar.

Fruits contain characteristic organic acids, such as malic in apples, citric in lemons, etc. These acids exist in the form of salts, usually of potassium. A little phosphoric acid, lime, iron, etc., also occur.

The flavor is due partly to the sugars and acids, and partly to characteristic ethereal bodies present in small quantities. Chemists have isolated the ethers and oils which give the peculiar flavor to bananas, strawberries and other fruits.

Digestibility. Digestibility of fruits varies with the kind of fruit eaten and its mode of preparation; stewed fruits are more easily digested than raw fruits. Personal idiosyncracy has also much to do with digestibility in case of this class of food materials. Oranges, lemons, grapes and peaches are very generally digested with ease. Oranges are much used in invalid dietaries, their juice being very effective in allaying thirst. Orange juice is also commonly administered to infants, especially if fed artificially, for the sake of the mineral matter and to prevent constipation.

It is important to those who are obliged to exclude sugar from the dietary to know that fruits containing the least sugar are the plum, peach, apricot and raspberry. Those

containing the largest amounts are the apple, sweet cherry, grape and pear.

The apple exerts a most excellent influence upon the liver and kidneys, and is valuable in cases of acidity of the stomach.

The juice of the ripe pineapple contains a remarkable active digestive principle, similar to pepsin, termed bromelin, and so powerful is its action upon proteids that it will digest as much as one thousand times its weight within a few hours. It is especially valuable in diphtheria and diabetes.

Dates, figs and prunes are valuable for inactivity of the liver and most excellent laxatives. Dates owing to their high food value and sweetness offer sugar in a most harmless form to the child and are as satisfactory to them as candy.

The banana contains a large amount of starch, as much as the potato; therefore it should not be eaten in an unripe state. For invalids and children and others of delicate digestion, it should always be cooked.

Grape juice and other freshly expressed juices are refreshing and wholesome beverages, and can often be given to invalids when the pulp would prove irritating.

Nutritive Value. Fresh fruits are chiefly valuable for their refreshing, appetizing qualities, and for their mineral constituents. The organic acids form carbonates in the body, and by their alkalinity assist in the regulation of body processes.

In disturbed conditions of metabolism it is often important to know just what salts and acids fruits contain.

As already stated, the chief nutrients are carbohydrates. In fuel value, fresh fruits resemble given vegetables, as is shown by the following figures:

Kind of Fresh Fruit.	Calories Per. Pound.	Kind of Green Vegetables.	Calories Per. Pound.
Apples	290	Beans, string, fresh	195
Blackberries	270	Beets, fresh	215
Oranges	240	Carrots, fresh	210
Peaches	190	Onions, fresh	205

The dried fruits compare favorably with bread, dried beans and similar foods as to energy value, but the latter contain protein in considerable amounts, while in fruits it occurs only in small quantities. The fuel value of fruits is often increased by the sugar added in cooking or serving.

Fruits are also valuable for bulk, which is an essential factor in diet. Most of them contain a considerable proportion of indigestible matter. Intelligently used, fruits are a valuable part of a well-balanced diet, and their use should be encouraged.

Precautions in the Use of Fruit. Over-ripe or unripe fruit should not be eaten raw; besides inferior flavor there is danger of digestive disturbance.

Before serving, all fruit should be thoroughly washed to avoid germs. Digestive disturbances are more often caused by these germs than by the fruit itself. There is danger also of acquiring harmful intestinal parasites from raw fruits; in all doubtful cases, the food should be cooked.

BAKED APPLES

1 medium apple = 70 Calories.

Wipe and core apples. Put in a shallow dish with one tablespoon water to each apple; more may be added during cooking if necessary, put into the center of each apple two teaspoons sugar. Bake in a hot oven twenty to thirty minutes, or until soft; baste with the syrup every ten minutes. A little nutmeg may be added to the sugar, and a few drops of lemon juice to each apple. Care must be taken that apples do not lose their shape and break.

STEWED APPLE SAUCE, 90 CALORIES

Wash, pare, core and slice one apple; put in saucepan and add one teaspoon sugar and enough boiling water to partly cover. Cover and cook slowly without stirring until transparent and tender. Appetizing to serve with any breakfast food.

Pears and peaches may be cooked in the same way.

APPLES CUBAN STYLE

Pare and core sound, tart apples. Steam until almost tender; remove to a buttered pan; fill cavities with cocoanut, stick apples full of blanched almonds, baste with syrup made of sugar, water and lemon juice. Finish cooking in a hot oven, basting often. When serving, fill the cavities with jelly or the jellied juice.

APRICOT AND PRUNE SAUCE, 178 CALORIES[1]

¼ cup prunes.	1 cup cold water.
¼ cup dried apricots.	Sugar to taste.

Wash fruit carefully; soak over night and cook slowly for two hours. If cooked properly the fruit will need very little sugar, as the sugar in the fruit is developed by this method of cooking.

BAKED BANANA

1 medium banana = 64 Calories.

Raw, this fruit is often indigestible, but baked it acts as a stimulant to the nerves, being at once received and rapidly assimilated by the stomach. Cut bananas in halves; put in shallow pan; sprinkle with sugar and a little lemon juice and bake until soft.

Note.— The banana contains starch and should be thoroughly ripened before eating.

CRANBERRY SAUCE OR JELLY

1 cup cranberries.	½ cup water.
⅓ cup sugar.	

Pick over and wash cranberries. Put in saucepan and add sugar and water, bring to the boiling point and boil fifteen minutes. Strain and cool.

For jelly use one-half cup sugar and one-quarter cup water and after straining put into molds.

BAKED LEMON OR ORANGE

Bake a lemon or a sour orange in a moderate oven for twenty minutes. When done, open at one end and take out

[1] Without sugar.

the inside. Sweeten with sugar or molasses. This is excellent for hoarseness and pressure on the lungs.

ORANGE SUNFLOWER

Wash the orange. Put a three-tined fork into the stem end. Cut off each end down to pulp, leaving the stem end on fork, then pare off rind to pulp, cut out each section and place on small plate in sunflower fashion, the pieces of pulp for petals; fill centre with granulated sugar. Serve cold.

Note.— To cut nicely have a large, firm, cold orange and a sharp knife.

ORANGE NO. II

1 medium orange = 77 Calories.

Select a large, firm orange; wash, cut and peel skin down in eight parts, leaving them connected to stem end of orange to form the petals, folding them under the pulp. Separate pulp in sections and put ice between petals before serving.

DATE SAUCE

Prepare apples as for stewing and partially cook. Add equal quantity of stoned Dromedary Dates, and sugar to taste. Cook until dates are tender. Serve either hot or cold.

DATES FOR YOUNG CHILDREN

Wash the dates and lay in water for fifteen minutes, then remove and dry; take off the outer skin and remove the stone; put through meat chopper; add two teaspoons of orange juice to each cup of dates. This is good on toast or crackers and is very nourishing. It can be prepared and kept on hand summer and winter.

STEWED PRUNES

3 prunes = 72 Calories.

Wash and look over the prunes, cover with clear cold water and allow to stand on the back of range over night. In the morning put the saucepan where they will cook slowly for four hours.

Note.— No sugar is needed as prunes are 18 per cent. sugar, and by this manner of cooking are made very sweet. This simmering process renders them rich and juicy, while boiling toughens the skin. A little lemon juice is a pleasant addition.

Prunes are a valuable nutrient, and their use as a laxative is scarcely second to figs.

STEAMED RHUBARB, 234 CALORIES[1]

1 cup rhubarb (4 oz.).	¼ to ½ cup sugar.

Wash the rhubarb and cut it into inch pieces without removing the skin, as this gives a pretty pink color to the juice. Put it into an agate double boiler without water and steam one-half hour, or until soft. Do not stir, as it breaks the pieces. Sweeten to taste at once on taking from fire. If rhubarb cooks a minute too long — which means after it has gone to pieces — it will lose its delicious flavor.

Rhubarb is rich in oxalic acid, which does much to tone the system.

STEWED FIGS, 936 CALORIES

½ pound figs.	1 cup cold water.
¼ cup white sugar.	Juice ½ lemon.

Wash figs. Dissolve sugar in the water; add figs and bring slowly to boiling point. Stew two and one-half hours; when tender, add lemon juice.

Note.— Cut figs in small pieces; cook very slowly so as not to add more water.

DATE BON BONS

1 date	= 20–25 Calories.
1 walnut meat	= 6– 8 Calories.

Put salted almonds, or fourths of English walnuts into the inside of dates that have been cut open and stones removed. Roll in powdered or granulated sugar and serve.

[1] Calculated with ¼ cup sugar; with ½ cup sugar = 444 calories.

NUTS[1]

Nuts enter but little into the invalid's dietary, but as more attention is being paid to means of rendering them digestible, a word concerning them is not out of place.

Composition. The edible substance of nuts is concentrated food, containing little water, and with few exceptions, much fat. In general, nuts are also rich in protein. The average composition is as follows:

Water	1– 4%
Protein	6–15%
Fats	40–50%
Carbohydrates	6–10%

The only common nut containing much carbohydrate is the chestnut, which contains 73 per cent. The pignolia, peanut, butternut, almond, beechnut and pistachio contain over 20 per cent. of protein. The pecan, brazil nut, butternut, filbert, hickory nut and walnut contain over 60 per cent. of fat.

The ash content is comparatively high. Walnuts, almonds, etc., are rich in phosphoric acid.

Cooking of Nuts. Nuts are more often eaten raw than cooked. But the peanut is not considered palatable when raw, and the chestnut is very indigestible unless the starch is cooked, when it becomes very easily digestible. Almonds are widely used in confectionery.

Nuts may be used as staple articles of diet, in salad, soups, desserts, etc.

To insure the best utilization of nuts they must be thoroughly prepared for digestion by grinding or mastication. Nut butters offer much less resistance to digestion than raw nuts hastily eaten. On account of the high fat content, these products must be fresh, or the fat is likely to decompose (become rancid) and be irritating.

Nut flours and meals are made into bread or porridge. Almond meal (containing no starch and very little sugar) is often utilized as a bread for diabetics. The chestnut can-

[1] For further information, note "Nuts and Their Uses as Food," Farmer's Bulletin No. 332, U. S. Dept. of Agriculture, Washington, D. C.

not be so used, on account of its high content of starch. The peanut contains about 11 per cent. of carbohydrates, and hence is undesirable for this purpose.

Digestibility. Nuts have been considered very indigestible. This is due largely to improper mastication or other preparation for digestion; to the fact that they are a very concentrated food, and are often eaten when not needed. While nut protein, as nuts are ordinarily eaten, is not so easily nor completely digested as meat protein, there are experiments showing that on the whole, they are as thoroughly digested as an ordinary mixed diet. No experiments have been reported on the ease or rapidity of nut digestion.

Nutritive Value. Nuts are a concentrated food. This is clearly shown by the following figures:

1 lb. of Almonds	yield 2895 Calories.
1 lb. of Brazil nuts	yield 3120 Calories.
1 lb. of Filberts	yield 3100 Calories.
1 lb. of Hickory	yield 3345 Calories.
1 lb. of Peanuts	yield 2610 Calories.
1 lb. of Walnuts	yield 3075 Calories.

The high fuel value is due to the absence of water and the large amount of fat present. Nuts can be most advantageously used along with bulky foods, such as fruits and vegetables, and those lacking in fat, such as bread. In a vegetarian diet they become a valuable source of protein.

FUNGI AND ALGÆ

These substances have little nutritive value. They may be considered as food adjuncts, rather than foods proper.

Of fungi, mushrooms are the most commonly eaten. They are prized for their delicate flavor. Chemical analysis shows a high percentage of nitrogen, but although reported as protein, it is largely in an indigestible form.

Algæ and lichens are much used as food in some parts of the world and high claims are sometimes made for their nutritive value, but digestion experiments show that, although

they have a similar carbohydrate content to other succulent vegetable foods, these carbohydrates are not attacked by the ordinary digestive enzymes of the alimentary tract.

The most important alga, from the dietetic standpoint, is Irish moss. It is commonly used in making jellies or soothing beverages for invalids, but it has no nutritive value whatsoever.

The lichen most used as food is Iceland moss. It has frequently been recommended as a food for diebetics, but it is practically indigestible.

CHAPTER XI

NUTRITIOUS DESSERTS

HOT AND COLD DESSERTS — FROZEN DESSERTS

SOFT CUSTARDS, BAKED CUSTARDS, WHIPS AND SOUFFLES, JUNKET, CORNSTARCH PUDDINGS OR BLANC MANGE, RICE, TAPIOCA, CRACKER AND BREAD PUDDINGS, SAUCES

Properly prepared, the dessert may constitute a very large part of the nutriment represented in a meal. Dishes containing eggs, milk, cream, starches, etc., in large proportion are necessarily of high nutritive value, and become a useful means of administering these foods to patients who do not care for the flavor of plain milk, raw eggs, cereals, etc., or who are likely to become tired of them. For invalids, combinations of foods should always be simple, because the more complex the mixture of protein, fat and carbohydrate, the longer and more complicated is the process of digestion. Hence junket, which is simply flavored, coagulated milk, is one of the most digestible of desserts. As a rule, less sugar is relished in sickness than in health; an excess is apt to cause nausea.

Dainty service is most important. Baked custards and junkets are usually best served in the original individual molds to avoid danger of breaking, or in case of junket, of becoming watery. Sauces should never be poured over puddings till the moment of serving. Care must be taken to see that cold desserts are thoroughly chilled; a lukewarm custard is frequently nauseating and always unappetizing.

For the Diabetic. Omit the sugar from custards and add Sweetina to taste.

SOFT CUSTARDS

SOFT CUSTARD NO. I, 192 CALORIES

(Individual Rule.)

Yolk 1 egg.
1 tablespoon sugar.
Speck salt.
½ cup milk.

Scald milk in double boiler. Beat yolk, add salt and sugar and pour on gradually the scalded milk. Pour back into top of double boiler and stir constantly until it looks creamy or it coats the spoon and the foam has disappeared; then remove immediately from hot water. Cool and add flavoring desired; vanilla, orange or lemon extract.

Note.— If custard curdles, place saucepan over cold water and beat until smooth.

This custard is usually used for pudding sauces.

SOFT CUSTARD NO. II, 410 CALORIES

(Two Servings.)

1 cup milk.
2 eggs.
2 tablespoons sugar.
½ saltspoon salt.
¼ teaspoon vanilla or grating of nutmeg.

Reserve one egg white for meringue. Blend according to Soft Custard No. I. This custard is usually used as a foundation for puddings.

SOFT CUSTARD WITH LACTOSE, 500 CALORIES [1]

	Calories
8 ounces milk (1 cup)	160
1 egg	80
2 ounces of milk sugar (about 4 tablespoons)	240
Speck of salt	
2 to 3 drops of vanilla or Caramel made of 3 tablespoons of granulated sugar	20 (?)
	500

Blend according to Soft Custard No. 1. To make caramel: put the sugar in a pan directly over heat and burn until a very dark brown. Dissolve in hot water or milk.

1 Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

MERINGUE, 110 CALORIES[1]

1 egg white.
Speck salt.
2 tablespoons powdered sugar.
Lemon or orange juice.

Beat the egg until stiff and dry; add the salt, sugar and lemon juice to taste. Beat very little after adding the sugar.

FLOATING ISLAND, 506 CALORIES

Chill Soft Custard No. II; pour into serving dish and put meringue on top.

ORANGE CUSTARD

Peel, slice and remove seeds of oranges, put into serving dish. Chill Soft Custard No. II, pour over fruit and put meringue on top.

BANANA CUSTARD

Peel bananas and slice very thin with silver knife; put into serving dish and flavor with lemon juice. Chill Soft Custard No. II, pour over fruit and put meringue on top.

ALMOND PUDDING

Line a glass dish with slices of stale cake and put in some salted almonds. Pour a little sherry wine on the cake. Chill Soft Custard No. II and pour over. Put meringue on top, with some salted almonds in it.

BAKED CUSTARDS

BAKED OR CUP CUSTARD, 319 CALORIES

(Individual Rule.)

1 cup milk.
1 egg.
1½ tablespoon sugar.
½ saltspoon salt.
Flavoring to taste — nutmeg, cinnamon, vanilla, or lemon extract.

Scald the milk; beat egg, add sugar and salt and pour on gradually the scalded milk. Flavor to taste and pour into custard cups; place in deep pan and pour boiling water

[1] Without lemon and orange juice.

around until it almost reaches the top of cups. Bake in moderate oven about twenty minutes. If cinnamon is used for flavor, put one-half square inch into the milk when scalding.

Note.— To test when done, dip a pointed knife into water and plunge into the middle of the custard. If it looks set and the knife comes out clear, the custard is done; if milky, it is not cooked enough. If cooked too long the custard will curdle.

BAKED CUSTARD NO. II, 262 CALORIES

(Individual Rule.)

2/3 cup milk.	1/3 saltspoon salt.
1 egg.	Nutmeg.
1 1/2 tablespoon sugar.	1/4 teaspoon vanilla.

Blend according to Baked Custard No. I.

The smaller quantity of milk makes a little firmer custard.

WHITE CUSTARD, 163 CALORIES

1 egg white.	1/4 saltspoon salt.
1 tablespoon sugar.	1/2 cup rich milk.

Beat white of egg until very light; add sugar and salt and pour on gradually the milk. Flavor with vanilla, orange or lemon extract. Bake in cups set in pan of boiling water in a moderate oven about twenty minutes. When firm set on ice and serve cold. This may be taken by patient when the yolk of egg is prohibited.

CHOCOLATE CUSTARD, 250 CALORIES

(Individual Rule.)

2 teaspoons Walter Baker's chocolate.	2 egg yolks.
2 tablespoons milk.	2 teaspoons sugar.
6 tablespoons rich milk.	Speck salt.

Grate chocolate and mix with the two tablespoons milk; stir over the fire until smooth, add the rich milk, the well-beaten egg yolks, sugar and salt. Pour into custard cups set in pan of hot water (nearly to the top). Cook until custard is set. Serve hot or cold.

MALTED MILK CUSTARD, 107 CALORIES

(Individual Rule.)

1 tablespoon Horlick's Malted Milk.
1 egg yolk.
½ cup hot water.
Salt.

Mix the Malted Milk powder with enough of the hot water to make a smooth paste, add remainder of water and pour it gradually on to the well-beaten yolk. Butter custard cup, pour in the mixture and let it stand in a pan of boiling water in a moderate oven until custard is set.

BAKED CARAMEL CUSTARD, 293 CALORIES

(Individual Rule.)

⅔ cup milk.
1 egg.
Speck salt.
2 tablespoons sugar.
A few drops of vanilla.

Scald the milk. Put the sugar in a small saucepan, place over heat and stir constantly until the sugar is melted and a light brown color. Add milk and pour over the slightly-beaten egg. Add flavoring. Strain into buttered custard cups, place in a pan of hot water and bake until firm in a slow oven.

BAKED CUSTARD WITH LACTOSE, 360 CALORIES [1]

	Calories
1⅓ ounces of milk sugar (about 2⅔ tablespoons)	160
6 ounces of milk (12 tablespoons)	120
1 egg	80
Nutmeg or vanila	
Speck of salt	——

Beat the egg slightly. Warm the sugar and milk, stirring constantly, add to the egg, strain into a custard cup, and flavor. Bake in a pan of water in a moderate oven until a knife when cut into it will come out clean (30 minutes to 1 hour).

WHIPS AND SOUFFLÉS

Dainty and nutritious ways to serve the uncooked and slightly cooked white of eggs.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

FRUIT WHIP, 125-150 CALORIES

(Two Servings.)

Any fruit, fresh, canned or dried (properly prepared), or jellies may be used.

2 to 4 tablespoons fruit pulp.
White 1 egg.
Lemon juice.
2 tablespoons powdered sugar (or to taste).

Prepare the fruit pulp by scraping, grating or rubbing through a strainer. Beat the white of egg on platter until stiff. Add pulp, sugar and lemon juice to taste, and beat until very stiff. Heap in center of serving dish and pour Soft Custard No. I around it.

Note.— The apple is a favorite fruit for these whips. The juice of fresh fruits in season used with the raw white of egg makes an appetizing as well as a very nutritious lunch for the sick.

STRAWBERRY WHIP, 327 CALORIES

(Four Servings.)

1 cup fresh strawberries.
Whites 2 eggs.
⅓ cup powdered sugar.

Wash and hull the strawberries and mash slightly. Beat whites of eggs until stiff, add sugar and berries; beat until very stiff, using a broad bowl and a wire egg-beater, beating with a long, steady stroke. Pile lightly in a glass dish and serve with white or sponge cake.

GRAPE WHIP, 1445 CALORIES

(Six Servings.)

¾ cup grape juice.
White 1 egg.
5 tablespoons sugar.
1 cup double cream.

Beat the white of egg until foamy, add the grape juice mixed with the sugar and, lastly, the cream, then beat with a whip churn. Take off the froth as it rises and drain on a sieve. Pour the unwhipped mixture into small, high glasses and pile the whip on top. Serve cold.

OMELET SOUFFLE, 230 CALORIES[1]

(Individual Rule.)

Yolk 1 egg.	Speck salt.
3 tablespoons powdered sugar.	Whites 2 eggs.
2 tablespoons lemon juice.	Strawberry or fruit jam.

To the well-beaten yolk add the sugar, salt, lemon juice and rind. Beat the whites to the stiffest possible froth, then cut and fold into the yolk. Have ready a small baking dish, buttered and spread with a layer of the fruit; pour the omelet over it and bake in a moderate oven fifteen or twenty minutes. Test as for baked custard. Serve at once.

Note.— Do not use lemon rind if it will interfere medicinally.

CUSTARD SOUFFLE, 297 CALORIES

(Individual Rule.)

¾ tablespoon butter.	Yolk 1 egg.
1¼ tablespoons flour.	1¼ tablespoons sugar.
¼ cup scalded milk.	White 1 egg.

Melt butter, add flour and gradually the scalding milk. Cook thoroughly, pour on to the well-beaten yolk, add sugar and cool. Fold into mixture the well-beaten white. Turn into buttered custard cups and bake about fifteen minutes, until firm — determined by pressing with the finger. Take from oven and serve at once, or it will fall. Serve with Foamy Sauce.

LEMON SOUFFLE, 275 CALORIES

(Individual Rule.)

Yolk 1 egg.	¼ cup sugar.
Juice ¼ lemon.	White 1 egg.

Thoroughly beat yolk, add sugar, slowly, beating constantly; add lemon juice. Fold in the white beaten until dry. Pour into buttered custard cups, set in pan of hot water and bake twenty minutes or until firm, testing by pressing with finger. Serve plain or with Foamy Sauce.

[1] Without jam.

PEACH MERINGUE, 210 CALORIES[1]

(Individual Rule.)

1 cup yellow peaches.
Sugar to taste.
Yolk 1 egg.
Bread crumbs.
White 1 egg.
1 tablespoon powdered sugar.

Stew peaches in a very little water, sweeten to taste and stir in the well-beaten yolk. Butter a pudding dish and cover bottom with fine bread crumbs, put in the peaches and bake fifteen minutes. Cover with meringue made of white of egg and the powdered sugar; brown slightly in the oven. Serve cold.

JUNKET

Junket is a healthful and dainty dessert made simply of pure milk, and containing enough of the active principle of rennet found in the Junket Tablet to coagulate the milk. It is nutritious and has the added advantage of being easily digested.

Milk or cream that has been boiled, sterilized, condensed or evaporated cannot be used in making junket, and care must be taken not to heat the milk more than lukewarm, as hot milk spoils the action of the tablet.

For diabetic patients Sweetina may be used as a substitute for sugar in these recipes.

PLAIN JUNKET, 296 CALORIES

(Individual Rule.)

1 cup milk.
2 tablespoons sugar.
½ teaspoon brandy or wine.
¼ Hansen's Junket Tablet.
1 teaspoon cold water.

Heat the milk until lukewarm, add sugar and flavoring; when sugar is dissolved add the tablet dissolved in the cold water. Pour mixture immediately into sherbet cups or champagne glasses, partly fill. Stand in warm room undisturbed until firm like jelly, then put on ice to cool. Serve with whipped cream heaped on top, with one-half teaspoon bright jelly for garnish.

[1] Without bread crumbs and sugar.

Note.— For variety, whole strawberries or raspberries may be served with junket, or chopped English walnuts with the whipped cream. For garnish, candied cherries may be used.

If desired, the brandy and sugar may be omitted in making junket and served plain, with sugar and a grating of nutmeg.

CUSTARD JUNKET, 512 CALORIES

(Two Servings.)

½ cup hot milk.	2 tablespoons sugar.
1 egg.	¼ teaspoon vanilla.
2 tablespoons sugar.	½ Hansen's Junket Tablet.
¾ cup lukewarm milk.	2 teaspoons cold water.

Beat the egg, add two tablespoons sugar; pour on gradually the hot milk. Cook in top of double boiler; stir constantly until it thickens; take at once from the fire and cool. Mix two tablespoons sugar with the lukewarm milk, add to the *cooled* custard and blend thoroughly. When lukewarm add vanilla and the tablet dissolved in cold water; finish as for Plain Junket.

COCOA JUNKET, 280 CALORIES

(Individual Rule.)

1 tablespoon cocoa.	¼ Hansen's Junket Tablet.
2 teaspoons sugar.	1 teaspoon cold water.
2 tablespoons boiling water.	3 drops vanilla.
1 cup milk.	

Mix the cocoa, sugar, boiling water, and cook over heat and rub to a smooth paste; add gradually the fresh cool milk. Heat until lukewarm (not more), add vanilla and then tablet dissolved in the cold water. Finish as for Plain Junket and serve with sweetened cream or a Soft Custard.

PLAIN AND COCOA JUNKET WITH LACTOSE, 250 CALORIES[1]

	Calories
1 teaspoonful of cocoa	50
25 grams of milk sugar (scant 2 tablespoons)	100
5 ounces of milk (10 tablespoons)	100
¼ junket tablet dissolved in 1 ounce of cold water	—

Mix the cocoa and sugar, add the milk, and heat lukewarm, stirring constantly; add the dissolved junket, stir thoroughly, and leave in a cool place to set. For plain junket omit cocoa.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

CORNSTARCH PUDDING OR BLANC MANGE

Starch of various kinds is used in milk puddings. For children, invalids and dyspeptics such puddings are admirable. They must be thoroughly cooked, that the action of the heat may affect the starch. The combination of starch and milk gives a wholesome nutritive food, and the addition of eggs increases the food value.

CORNSTARCH PUDDING, 329 CALORIES

(Individual Rule.)

1 cup milk.	Speck salt.
1½ tablespoons cornstarch.	White 1 egg.
1½ tablespoons sugar.	Vanilla.

Scald the milk in double boiler. Mix cornstarch, sugar and salt thoroughly; add slowly the scalded milk, stirring constantly. Return to top of boiler and cook twenty minutes, stirring constantly for the first five or six minutes, then occasionally. Remove from fire and while very hot fold in lightly, but thoroughly, the well-beaten white of egg. When partially cooled add flavoring to taste; put into wet cups or molds, cool and then stand for several hours on ice. Remove from molds. Serve with a soft custard, mashed fresh berries, or whipped cream. Vary the pudding by adding a little Walter Baker's chocolate, melted.

PINEAPPLE CREAM, 340 CALORIES

(Individual Rule.)

1 cup milk.	Speck salt.
1½ tablespoons cornstarch.	White 1 egg.
1½ tablespoons sugar.	2 tablespoons grated pineapple.

Follow directions for Cornstarch Pudding, adding the pineapple instead of vanilla. Pour into individual molds and serve cold with cream.

CORNSTARCH FRUIT JELLY, 166 CALORIES [1]

(Two Servings.)

1 cup raspberry juice.	2 tablespoons cornstarch.
Sugar.	

[1] Without sugar.

Sweeten the juice to taste and heat to boiling point. Make a smooth paste of the cornstarch and a little cold water, add slowly to the juice and cook thirty minutes in top of double boiler, stirring constantly at first. Pour into cold, wet molds. Serve cold with whipped cream and fresh, whole berries.

MALTED MILK BLANC MANGE, 280 CALORIES
(Two Servings.)

- 2 tablespoons Horlick's Malted Milk.
- 2 tablespoons powdered arrowroot.
- Speck salt.
- 1 tablespoon sugar.
- 1½ cups boiling water.
- ¼ teaspoon vanilla.

Mix the arrowroot and Malted Milk powder with a little cold water into a smooth paste. Add the boiling water slowly, cook in double boiler about twenty minutes, or until arrowroot is thoroughly cooked, add vanilla and pour into cold, wet molds. Chill and serve with Soft Custard or whipped cream.

Note.— One teaspoon powdered coffee may be added to above before cooking, for Coffee Blanc Mange.

NUTRITIOUS WHEAT PUDDING, 252 CALORIES
(Individual Rule.)

- 1 cup milk.
- 2½ tablespoons flour.
- Speck salt.
- White 1 egg.
- ¼ teaspoon vanilla.

Blend flour with a little of the cold milk. Scald remainder of milk and add flour mixture; cook thoroughly; add salt and flavoring and fold in the white of egg beaten slightly. Put into cold, wet mold, cool and set in ice box to harden. Serve with Soft Custard or whipped cream, or sprinkle with powdered sugar and pour over it one-fourth cup of fresh fruit juice or crushed fruit.

GLUTEN PUDDING (FOR THE DIABETIC), 861 CALORIES
(Six Servings.)

- 3 tablespoons Gum Gluten Flour.
- 1 pint hot milk.
- 1 pint cold milk.
- 1 egg.
- 1 teaspoon butter.
- 1 saltspoon salt.
- Cinnamon.
- Sweetina.

Blend Gum Gluten Flour with a little of the cold milk, add gradually to one pint hot milk. Cook thoroughly. Beat egg, add cold milk, the cooked mixture and salt, cinnamon and Sweetina to taste. Bake thirty minutes. A little fruit improves the flavor. Serve with whipped cream.

IRISH MOSS JELLY, 677 CALORIES

(Three Servings.)

½ cup Irish moss.
2 cups boiling water.
4 figs.
Juice 1 lemon or orange.
⅓ cup sugar.

Soak, pick over and wash the moss. Put it into the boiling water, add the figs cut into strips and *simmer* about twenty minutes, or until it is very thick when dropped on a cold plate. Add lemon juice and sugar. Strain into a cold, wet mold.

IRISH MOSS BLANC MANGE, 296 CALORIES

(Four Servings.)

¼ cup Irish moss.
1½ cups cold water.
1¾ cups milk.
¼ saltspoon salt.
⅓ teaspoon vanilla.

Soak the moss in cold water about fifteen minutes. Remove from water, pick over and put into double boiler with the milk. Cook about twenty minutes, or until it thickens when dropped on a cold plate. Add salt, strain and flavor. Strain again and turn into small cold, wet molds. Chill and serve with cream and sugar or sliced fruit.

RICE PUDDINGS

BOILED RICE, 100 CALORIES

(Individual Rule.)

2 tablespoons rice.
2 cups boiling water.
½ teaspoon salt.

Wash rice thoroughly and add gradually to the boiling salted water, care being taken that the water does not stop boiling. Boil uncovered twenty minutes, or until grains

are soft. Turn into a strainer and pour over it one cup of hot water and drain, put in oven a few moments to dry, with oven door open. Serve as a cereal with sugar or cream or as a pudding with cooked dates and whipped cream, or plain with Soft Custard.

Note.— Keep rice well covered with water while cooking.

Dates.— Cut in small pieces, add a little water to partly cover and cook until soft. Simmer and do not stir.

STEAMED RICE, 265 CALORIES

(Individual Rule.)

⅓ cup rice.
1 cup boiling water.
½ teaspoon salt.

Pick over the rice, wash in three or four waters; put it with the boiling water and salt in upper part of double boiler. Do not stir while cooking. Steam one hour, or until the grains are tender. Serve as a cereal with sugar or cream or as a pudding with Soft Custard, or with sugar and cream.

Note.— A few dates cut in narrow strips may be added just before serving if desired. Part milk may be used in the cooking.

PEACHES AND RICE

Serve boiled or steamed rice with sections of fresh, juicy peaches, or with fresh berries. Serve with sugar and cream.

DATES AND RICE, 1035 CALORIES

1 tablespoon sugar.
1 cup Dromedary Dates.
¼ cup boiling water.
1 cup boiled or steamed rice.

Put dates, sugar and boiling water in sauce pan and simmer three minutes. Make border around serving dish with the boiled or steamed rice and fill center with the date mixture. Serve with cream.

SOUTHERN SNOWBALLS, 367 CALORIES

(Individual Rule.)

¼ cup rice.
1 cup milk.
¼ teaspoon salt.

Pick over rice, wash in several waters and put with milk and salt in top of double boiler. Cook until the milk is absorbed and rice is tender. Do not stir while cooking. Dip

egg cups in cold water and pack with rice carefully but tightly, turn out on serving dish, sprinkle with powdered sugar, put a candied cherry or a strawberry on top, and serve with whipped cream.

PLAIN RICE PUDDING, 746 CALORIES

(Individual Rule.)

1 cup steamed rice.
1 cup scalded milk.
½ tablespoon butter.
1 egg.
2 tablespoons sugar.
½ saltspoon salt.
¼ cup stoned raisins.

Scald milk and add butter. Beat egg, add sugar and salt and pour on slowly the scalding milk. Put in pudding dish with rice and raisins. Bake in a moderate oven until custard is set. Serve with Hard Sauce.

Note.— Do not use raisins in case of bowel trouble.

RICE MERINGUE, 526 CALORIES

(Two Servings.)

¼ cup cold cooked rice.
1 cup scalded milk.
2½ tablespoons sugar.
½ saltspoon salt.
Egg yolk.
Vanilla.
1 egg white.
2 tablespoons powdered sugar.

Blend rice and milk and soak until soft. Beat the yolk, add sugar and salt and gradually the hot milk and rice. Cook until it thickens like soft custard. Add flavoring to taste and pour into pudding dish or custard cups. Make a meringue of the white of egg and powdered sugar, cover the pudding and brown slightly in the oven.

CREAM OF RICE PUDDING, 657 CALORIES

(Three Servings.)

¼ cup rice (well washed).
2 tablespoons sugar.
Grated rind of ⅓ lemon.
1 saltspoon salt.
1 pint milk.

Mix all ingredients in a small baking dish. Bake two hours, slowly at first until rice is softened and thickened in the milk. Cut the crust several times, stirring to the bottom gently. The crust will then dissolve in the pudding, giving it a creamy color. Then let it brown slightly.

TAPIOCA PUDDINGS

TAPIOCA CREAM, 483 CALORIES

(Two Servings.)

1½ tablespoons Minute tapioca.	1 cup scalded milk.
1½ tablespoons sugar.	1 egg.
½ saltspoon salt.	Flavoring.

Scald milk in double boiler. Mix tapioca, sugar and salt; add slowly to the scalding milk, return to double boiler and cook fifteen minutes. Add the yolk and white of the egg, beaten separately. Remove from fire and add flavoring desired. Serve plain or with any fresh fruit in season.

PLAIN TAPIOCA, 451 CALORIES

(Three Servings.)

1½ tablespoons Minute tapioca.	1 cup scalded milk.
1 tablespoon sugar.	¼ cup raisins.
Salt.	Nutmeg.

Scald milk in double boiler and gradually add the tapioca and sugar. Cook fifteen minutes. Add salt, nutmeg to taste and seeded raisins. Serve with cream and sugar.

Note.— Raisins should never be used in bowel trouble.

PINEAPPLE TAPIOCA, 718 CALORIES

(Three Servings.)

¼ cup Minute tapioca.	1½ cups boiling water.
¼ cup sugar.	1 cup canned grated pineapple.
Speck salt.	

Mix tapioca, sugar and salt, pour on slowly the boiling water and cook in double boiler until clear, about fifteen minutes. Pour over the grated pineapple and decorate the top of the pudding with currant jelly.

APPLE TAPIOCA, 345 CALORIES [1]

(Three Servings.)

¼ cup Minute tapioca.	1 pint boiling water.
1 tablespoon sugar.	3 tart apples.
Speck salt.	Sugar, nutmeg.

[1] Without extra sugar.

Mix tapioca, sugar and salt, pour on slowly the boiling water, and cook in double boiler fifteen minutes. Pour this onto the apples, which have been pared and cored and the holes filled with sugar and a little nutmeg. Cover the dish and bake one-half hour. Serve with cream and sugar.

RASPBERRY TAPIOCA, 218 CALORIES

(Three Servings.)

1½ tablespoons Minute tapioca.	½ cup raspberry juice.
1½ tablespoons sugar.	Juice ½ lemon.
1 cup boiling water.	Speck salt.

Mix tapioca, sugar and salt, pour on slowly the boiling water and cook in double boiler fifteen minutes. Add raspberry and lemon juice. When it begins to jelly, beat smooth with a spoon. Serve plain or with whipped cream.

DATE TAPIOCA, 660 CALORIES

(Three Servings.)

1½ tablespoons Minute tapioca.	1 cup scalded milk.
1 tablespoon sugar.	1 egg.
½ saltspoon salt.	¼ cup chopped dates.

Mix tapioca, sugar and salt; add gradually the hot milk and cook in double boiler fifteen minutes. Add the beaten egg yolk and cook three minutes longer. Stir in the dates. Make a meringue of the white of egg, heap it on top and brown delicately in the oven.

CHOCOLATE OR COCOA BLANC MANGE, 827 CALORIES[1]

(Three Servings.)

¼ cup Minute tapioca.	1½ cups hot chocolate or cocoa.
¼ cup sugar.	¼ teaspoon vanilla.
¼ teaspoon salt.	

Mix tapioca, sugar and salt; pour on gradually the hot cocoa and cook in double boiler about twenty minutes. Remove from heat, add vanilla and pour into cold, wet molds. Serve cold, plain or with whipped cream or Soft Custard.

[1] Calculated with chocolate, recipe page 135.

BREAD PUDDINGS

The principle of employing farinaceous matter which has already been subjected to heat (so that a considerable conversion of starch has gone on before the human salivary diastase comes into play) is carried out in practice in the form of bread puddings.

PLAIN BREAD PUDDING, 900 CALORIES

(Two Servings.)

- 1 cup stale bread.
- 1 cup milk.
- 1 tablespoon butter.
- 1 egg.
- 2 tablespoons sugar (to taste).
- ½ saltspoon salt.
- ¼ cup seeded raisins.

Scald milk and add butter. Beat the egg and add sugar and salt; pour on gradually the scalding milk. Cut the bread into one-half inch cubes and add with the raisins. Pour into well-buttered pudding dish, put bits of butter on top and bake in a moderate oven until the custard is set. Serve with Hard Sauce or cream and sugar.

Note.— Do not serve raisins in bowel trouble.

ORANGE BREAD PUDDING, 919 CALORIES

(Two Servings.)

- ¾ cup stale bread.
- ½ cup milk.
- 2 eggs.
- 2 oranges.
- 6 tablespoons sugar.

Soak bread in the milk until soft and beat lightly with fork; add the grated rind of one orange and the juice of both; sweeten. Beat the whites very light and add to above mixture. Pour into custard cups and cook as for baked custard — about fifteen or twenty minutes. Serve plain or with Hard Sauce.

Note.— Omit orange rind if it will interfere medicinally.

LEMON BREAD PUDDING, 543 CALORIES

(Two Servings.)

½ cup milk.
½ cup soft bread crumbs.
Yolk 1 egg.
Speck salt.
3 tablespoons sugar.
½ tablespoon butter.
Grated rind ¼ lemon.

Scald milk and add butter. Beat the egg yolk, add sugar and salt and pour on gradually the scalded milk. Add the bread crumbs and grated lemon rind; pour into a buttered pudding dish and bake in a moderate oven about fifteen minutes, or until set like baked custard.

Make a meringue by beating the white of egg very stiff, adding two tablespoons powdered sugar and juice of one-fourth lemon. Cover the pudding with it and set in the oven till a dainty brown.

Note.— Do not use lemon rind if it will interfere medicinally. For the crumbs, rub soft bread through a coarse strainer.

JELLY BREAD PUDDING

Prepare the same as for Lemon Bread Pudding, omitting the lemon rind and juice. Spread any tart jelly over pudding when baked and add meringue.

CHOCOLATE BREAD PUDDING, 904 CALORIES

(Two Servings.)

½ cup stale bread crumbs.
1 cup milk.
½ ounce (or square) Walter Baker's unsweetened chocolate.
2½ tablespoons sugar.
1 egg.
Speck salt.
¼ teaspoon vanilla.

Soak bread crumbs in milk. Melt chocolate over hot water and add to it the sugar and salt. To the chocolate mixture, add the soaked crumbs, the beaten egg and vanilla. Put into buttered custard cups and bake in a moderate oven about twenty minutes, or until custard is set. Serve hot, plain or with Hard Sauce.

LACTOSE BREAD PUDDING, 560 CALORIES[1]

	Calories
1½ ounces of milk sugar (about 3 tablespoons)	180
6 ounces of milk (12 tablespoons)	120
1 egg	80
1 slice of bread (⅜ inch thick)	60
½ ounce of butter (1 level tablespoon)	120
	560

Spread the bread with butter and cut into squares. Beat the egg slightly; heat the milk and sugar, stirring constantly; mix with the egg and pour over the bread. Grate nutmeg over the top and bake the same as the custard.

GLUTEN BROWN BETTY (FOR THE DIABETIC), 222 CALORIES[2]

3 Gum Gluten Biscuit Crisps.
1 large sour apple.
2 teaspoons butter.
Sugar.
Cinnamon.

Into a well-buttered individual baking dish place one crushed Biscuit Crisp; onto this put one-half apple cooked as for apple sauce or raw cut in thin slices or chopped; season with sugar, speck of cinnamon and bits of butter. Add another layer of crumbs (one Biscuit Crisp), then the remaining half of apple and seasoning, lastly crumbs. Place bits of butter on top, put in slow oven, and bake.

CRACKER PUDDINGS

CRACKER PUDDING, 397 CALORIES

(Two Servings.)

1½ soda crackers.
1 cup milk.
⅛ teaspoon salt.
Yolk 1 egg.
2 tablespoons sugar.

Roll the crackers and soak in the milk. Beat yolks and sugar well together and add to pudding with salt. Bake one-half hour. Make a meringue with the whites of the eggs, pile lightly on top and put in oven till golden brown. Serve hot.

1 Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.
2 Without sugar.

ENGLISH WALNUTS AND BISCUIT CRISPS (FOR THE DIABETIC), 154 CALORIES

(Individual Rule.)

2 Gum Gluten Biscuit Crisps.
2 hot tablespoons thin cream.
½ teaspoon butter.
4 walnut halves.
Parsley.

Butter Biscuit Crisps and place in oven until well heated through. Dip the nuts in melted butter and cook, turning often until heated. Cover each Crisp with one tablespoon of hot cream and serve two nuts on each Crisp; garnish with sprig of parsley.

Note.— Buttered Biscuit Crisps may be served heated and served with ground nut meats over top.

PUDDING SAUCES

HARD SAUCE, 650 CALORIES

(Four Servings.)

3 tablespoons butter.
6 tablespoons powdered sugar.
Nutmeg.
½ white of egg.
½ tablespoon cream.

Cream butter; add sugar gradually. When light and creamy add the unbeaten white of egg and the cream, a drop or two at a time. Season highly. Heap on serving dish and cool.

FOAMY SAUCE, 863 CALORIES

(Three Servings.)

¼ cup butter.
½ cup powdered sugar.
½ egg.
1 tablespoon wine.

Cream butter; add sugar gradually, the well-beaten egg and the wine. Heat over hot water, beating constantly. Serve immediately.

TO WHIP CREAM

½ cup thick cream (40%) = 432 Calories.

Do not have cream too thick; season with sugar and any flavoring desired; put in bowl and set bowl in another utensil containing a little cold water and ice. Beat cream with Dover

egg-beater until stiff enough to keep its form. Set on ice to keep cold.

Note.— Do not beat too long or it may turn to butter. To one-half cup thick cream add three tablespoons milk.

WHIPPED CREAM NO. II.

1 egg white = 10 to 15 Calories.

Follow the above recipe, and add the white of one egg beaten stiff, folding it into the stiffly-beaten cream.

FRUIT SAUCE, 75 CALORIES

(Two Servings.)

6 tablespoons fruit juice.
½ teaspoon arrowroot or cornstarch.

Blend starch with a little cold water and pour into the hot fruit juice. Boil two or three minutes. Sweeten if desired.

ORANGE SAUCE

See chapter "Gelatin" for recipe. Page 210.

FROZEN DESSERT

ICE CREAM — SHERBET — ICES

Frozen dishes not only constitute an acceptable form of serving nutriment, but often are a means of furnishing additional liquid and relieving thirst. Ices and sherbets made with fruits and water, have a dietetic value similar to acid beverages. Frozen cream, milk, junkets, custards, etc., have the same nutritive value as the same foods served without freezing.

In giving all very cold dishes, care must be taken not to interfere with the digestion of other foods. Chilling the mouth hinders the formation and activity of saliva; chilling the stomach retards gastric digestion. The latter effect can be avoided by eating ice-cold food very slowly, so that it is partially warmed before reaching the stomach. Frozen foods should not be given when ptyalin digestion is especially important.

General Rules for Freezing. Ice (or snow) and salt are required for the process of freezing. The salt melts the ice, and in melting absorbs heat from the mixture, thus causing it to freeze. The finer the ice, the more quickly the freezing will be accomplished. In packing a freezer allow three level measures of ice to one of salt. This proportion is found best for fine-grained mixture. The can should not be filled more than three-fourths full, as the liquid expands in freezing, and if over-crowded, the cream will become coarse-grained and the cover may be pushed up allowing the salt water to get in.

Freezing in Small Amounts. Put mixture to be frozen into a water-tight baking powder can, or a small tin pail with cover, and stand in large pail or bowl. Pack the ice and salt alternately under and around it (ice pounded fine), using one part salt to three parts ice. Remove cover, and beat mixture with Dover egg-beater until foamy, replace cover and turn can, or pail, back and forth; remove cover occasionally and scrape the frozen mixture from side of can, and beat thoroughly with fork. The mixture will freeze in twenty minutes. When frozen, place a narrow strip of cloth, dipped in melted beef fat or lard, around the outside of cover to keep out the salt water. Repack in ice, or ice and salt, and cover well until wanted.

Serve frozen dishes in sherbet, champagne, or high glasses; pass on small plate covered with doily, and at the side of the plate a small cake, wafer or a few orange straws may be added; a rose will add to the attractiveness.

ICE CREAM

VANILLA ICE CREAM, 310 CALORIES [1]

(Individual Rule.)

½ cup thin cream or ¼ cup heavy cream and ¼ cup milk.
1½ tablespoons sugar.
½ teaspoon vanilla.
Speck salt.

Blend all the ingredients; when sugar is dissolved, freeze in a small pail according to general directions.

[1] Calculated with thin cream.

VANILLA ICE CREAM WITH LACTOSE, 520 CALORIES[1]

	Calories
4 ounces of cream (¼ pint or ½ cup)	240
2 ounces of milk (4 tablespoons)	40
2 ounces of milk sugar (about 4 level tablespoons)	240
Speck of salt	
Few drops of vanilla	—
	520

Mix cream, milk, and sugar, and heat, stirring constantly, until the sugar is dissolved. Then flavor, cool, and freeze.

CHOCOLATE ICE CREAM, 353 CALORIES[2]

(Individual Rule.)

½ cup thin cream or ¼ cup heavy cream and ¼ cup milk.
¼ square Walter Baker's chocolate.
1½ tablespoons sugar.
1 tablespoon boiling water.
¼ teaspoon vanilla.
Speck salt.

Melt the chocolate over hot water, add the boiling water, sugar and hot cream. Cool, add vanilla and salt and freeze in small pail according to general directions.

NOTE.— To make a large quantity, double recipe as many times as desired.

COFFEE ICE CREAM, 352 CALORIES[1]

(Individual Rule.)

½ cup thin cream or ¼ cup heavy cream and ¼ cup milk.
1 tablespoon ground coffee.
1½ tablespoons sugar.
Speck salt.
¼ cup milk.

Mix coffee and milk, put into double boiler and cook five minutes. Strain through cheese-cloth and strainer; add sugar, salt and cream. Cool and freeze in small pail, according to general directions.

1 Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1916
2 Calculated with thin cream.

GRAPE JUICE ICE CREAM, 490 CALORIES

(Individual Rule.)

½ cup thin cream.
¼ cup grape juice.
¼ cup sugar.

Scald one-half cup of the cream and add the sugar. Cool, add remainder of cream and the grape juice and freeze according to general directions.

STRAWBERRY ICE CREAM, 356 CALORIES

(Individual Rule.)

½ cup thin cream or ¼ cup heavy cream and ¼ cup milk.
¼ cup strawberries.
2 tablespoons sugar.
Speck salt.

Mash the strawberries with the sugar and allow them to stand five minutes. Add the cream and milk and freeze in small pail according to general directions.

Note.— The berries may be mashed and strained through cheese-cloth.

RASPBERRY ICE CREAM, 363 CALORIES

(Individual Rule.)

½ cup thin cream or ¼ cup heavy cream and ¼ cup milk.
¼ cup raspberries.
2 tablespoons sugar.
Speck salt.

Mash the raspberries and strain through cheese-cloth. Add cream, milk and sugar. Freeze in small pail according to general directions.

PEACH ICE CREAM, 390 CALORIES

(Individual Rule.)

½ cup thin cream or ¼ cup heavy cream and ¼ cup milk.
¼ cup peaches.
2 tablespoons sugar.

Mix peaches and sugar and press through a potato-ricer or sieve. Scald cream and milk. Cool and add peaches and sugar. Freeze in small pail according to general directions.

CARAMEL ICE CREAM, 340 CALORIES

(Individual Rule.)

½ cup thin cream or ¼ cup thick cream and ¼ cup milk.
2 tablespoons sugar.
1¼ tablespoons boiling water.
⅓ teaspoon vanilla.
Speck salt.

Into saucepan place the sugar and stir constantly until melted. Add water and boil until reduced to one and one-half tablespoon. Add cream very slowly, vanilla, salt, and freeze.

CARAMEL ICE CREAM NO. II, 5942 CALORIES

(Ten Servings.)

1 pint milk.
1 cup sugar.
2 tablespoons flour.
1 scant cup sugar for caramel.
2 eggs.
Speck salt.
1 quart cream.

Scald the milk; mix one cup sugar, flour and salt, add the eggs and beat all together until perfectly smooth and light. Add the scalding milk gradually, beating until very smooth. Cook in double boiler twenty minutes.

While cooking, prepare caramel. Put the second cup of sugar in sauté pan, and cook until melted and a delicate brown; add gradually the custard, stirring constantly; strain and cool. Add the cream (which has been scalded and cooled) and freeze in large freezer.

Note.— This may be used for vanilla ice-cream by omitting the caramel and using one tablespoon vanilla and enough of the second cup of sugar to sweeten.

MALTED MILK ICE CREAM, 3900 CALORIES [1]

(Ten Servings.)

½ pound Horlick's Malted Milk.
1 cup granulated sugar.
1 quart water.
White 1 egg.
1 pint cream.
2 ounces chocolate.
1 tablespoon vanilla.

Mix the malted milk powder, sugar and boiling water, stirring until smooth. Add cream and scraped chocolate and cook until chocolate is melted. Add vanilla, cool and freeze.

[1] Thick cream.

When partly frozen, add the well-beaten white of egg, and finish freezing.

Note.— If strawberry or other flavor is desired, it may be used in place of vanilla.

PEPTONOIDS ICE CREAM, 1274 CALORIES

4 tablespoons Dry Peptonoids Soluble.	½ pint thin cream.
½ cup sugar.	1 oz. chocolate.
1 pint of water.	½ tablespoon of vanilla.
	White of 1 egg.

Mix Dry Peptonoids Soluble, sugar and boiling water. Stir until smooth. Add cream and scraped chocolate. Cook until chocolate is melted. Add vanilla; cool and freeze. When partially frozen, add well-beaten white of egg.

FROZEN CUSTARD, 349 CALORIES

(Two Servings.)

1 cup hot milk.	2 tablespoons sugar.
1 egg.	¼ teaspoon vanilla.
Speck salt.	

Beat the egg, add the sugar and salt and gradually the scalded milk. Cool, add flavoring and freeze.

HOT COCOA SAUCE FOR ICE CREAM, 1035 CALORIES

(Six Servings.)

1½ cups water.	2 tablespoons Walter Baker's cocoa.
1 cup sugar.	1 teaspoon vanilla.
1 tablespoon arrowroot.	
Speck salt.	

Boil together the water and sugar for two minutes; add the arrowroot mixed with a little cold water, stir for a moment, then boil until clear. Add the cocoa, which has been mixed with a little hot water, and the salt, and boil three minutes longer. Remove from the fire and add the vanilla.

SHERBET

LEMON MILK SHERBET, 299 CALORIES

(Individual Rule.)

½ cup milk.
¼ cup sugar.
Juice of ¼ lemon.
1 drop lemon extract.

Blend all the ingredients and freeze in small pail according to general directions.

LEMON MILK SHERBET, NO. II, 2390 CALORIES

(Six Servings.)

1 quart milk.
1 pint sugar.
Juice 2 lemons.
½ teaspoon lemon extract.

To the lemon juice add the sugar, milk and extract. Freeze immediately in large freezer.

STRAWBERRY SHERBET, 357 CALORIES

(Individual Rule.)

½ cup milk.
1 cup strawberries.
¼ cup sugar.

Mash the berries and strain. To the juice add sugar and milk. Freeze in small pail according to general directions.

STRAWBERRY SHERBET NO. II, 2940 CALORIES

(Six Servings.)

1 quart milk.
2 quarts strawberries.
2 cups sugar.

Mash the berries and strain. Add sugar and milk. Freeze in large freezer.

CLAM SHERBET, 128 CALORIES

(Individual Rule.)

¾ cup milk.
¼ cup clam broth.
Speck paprika.

Blend and freeze according to General Rule. Serve in small dainty glasses with a teaspoon of unsweetened whipped cream on top. The milk and clam taken in this way are often more acceptable to the patient than when served in liquid form.

Note.— The paprika may be omitted if condiments are not desirable.

MALTED MILK SHERBET, 2148 CALORIES

(Six Servings.)

½ pound Horlick's Malted Milk.
1 cup granulated sugar.
3 pints water.
1 tablespoon vanilla.
2 ounces chocolate.
White 1 egg.

Make a smooth paste of the malted milk powder and a little of the water, then add the rest of the water gradually, the sugar, vanilla and the chocolate grated. Freeze. When partly frozen, add the well-beaten white of egg and finish freezing.

GRAPE SHERBET, 3265 CALORIES

(Ten Servings.)

3 cups grape juice.
1 quart water.
3 cups sugar.
White 2 eggs.

Blend the grape juice, water and sugar. Partly freeze. Beat the whites of eggs lightly, add two tablespoons powdered sugar; add to sherbet and continue freezing until hard. Remove dasher and allow it to stand for one hour to ripen. Pack carefully.

GRAPE AMBROSIA, 5243 CALORIES

(Twelve Servings.)

1 quart milk.
2 quarts water.
3½ cups sugar.
Whites 4 eggs.
1 pint grape juice.
1 can grated pineapple.
Juice 3 lemons.

Mix together milk, water, sugar and fruit and partially freeze. Add the well-beaten whites of eggs and continue freezing until hard.

ICES

ORANGE ICE, 252 CALORIES

(Individual Rule.)

½ cup water.
Juice 1½ oranges.
1 tablespoon lemon juice.
¼ cup sugar.

Mix together all the ingredients and freeze in small pail according to general directions.

ORANGE ICE NO. II, 990 CALORIES

(Four Servings.)

2 tablespoons shredded gelatin.
½ cup cold water.
1½ cups boiling water.
1 cup sugar.
1 cup orange juice.
Juice 1 lemon.

Soak gelatin in the cold water twenty minutes; add boiling water; when gelatin is dissolved add the sugar, orange and lemon juice. Cool, strain and freeze in large freezer.

ORANGE ICE NO. III, 1922 CALORIES

(Four Servings.)

1 pint orange juice.
Juice 2 lemons.
1 pint sugar.
Grated rind 1 orange.
1 quart water.

Boil the water and sugar twenty minutes; add fruit juice and rind of orange. Cool, strain and freeze in large freezer.

Note.— Do not use orange rind if it will interfere medicinally.

LEMON ICE, 257 CALORIES

(Individual Rule.)

½ cup water.
Juice 1 lemon.
4 tablespoons sugar.

Mix all the ingredients and freeze in small pail according to general directions.

FRUIT ICE, 497 CALORIES

(Individual Rule.)

½ banana.
⅓ cup strawberries.
Juice ½ orange.
Juice ½ lemon.
½ cup cold water.
½ cup sugar.

Put the fruit into a coarse strainer (or a potato-ricer), rubbing it through into a large bowl. Pour the cold water through the strainer. Add the sugar, stir well and freeze according to general directions.

PINEAPPLE ICE, 242 CALORIES

(Individual Rule.)

- 1/3 cup grated pineapple.
- 1 tablespoon lemon juice.
- 1/2 cup water.
- 2 tablespoons sugar.

Boil the water and sugar together about three minutes; add pineapple and lemon juice. Cool, strain and freeze according to general directions.

GRAPE FRAPPE, 2175 CALORIES

(Six Servings.)

- 1 pint grape juice.
- Juice 1 lemon.
- 1 pint water.
- 2 cups sugar.

Boil the water and sugar together for five minutes; cool and add the grape and lemon juice. Freeze to the consistency of a mush. Serve in tall glasses with sweetened whipped cream piled high on top.

CLAM FRAPPE

(Individual Rule.)

- 3/4 cup cold water.
- 1/4 cup clam broth.
- Speck paprika.

Blend and freeze according to General Rule, to the consistency of a soft Water Ice. Serve in small punch-glasses or champagne glasses, with a teaspoon of unsweetened whipped cream on top — Delicious to serve for dinner in place of shellfish.

SCALPICON OF FRUIT

A delicious scalpicon is made by cutting all kinds of fresh fruits into small pieces flavoring with wine or lemon juice and sugar. Put into serving dish with Orange or Lemon Ice on top. Serve individually in champagne glasses on a small plate with doily, with a single rose or other flower to correspond with color of ice.

ORANGE STRAWS

Peel the orange or lemon lengthwise; cut into long, narrow strips, about one-fourth of an inch wide. Put into saucepan

and cover with cold water and bring to the boiling point and pour off the water; repeat this process five or six times, or until the bitter taste of peel is extracted. Drain thoroughly and cover with granulated sugar. Cook until sugar is dissolved and is thick and hardens in cold water. Then roll straws in granulated sugar and cool. Serve with Orange Ice, etc., or as a bon-bon.

CHAPTER XII

CAKE

The two methods of making cake light are by means of air and of gas. Air is introduced by beating, or by the addition of beaten eggs, as in sponge cake. When the lightness is entirely dependent upon air, the whites and yolks of eggs should be beaten separately.

Gas may be generated from within by combining an acid and alkali and adding moisture; as cream of tartar and bicarbonate of soda; or sour milk and soda; or molasses and baking powder. The combination of both air and gas is used to raise butter cakes.

General Directions for Cake Making. Before blending the cake, see that the oven is at right temperature for baking and the pans greased with a little beef fat and dredged with flour. The pan may be lined with paper to prevent cake burning on bottom when cake requires long baking or when the oven bakes too quickly on the bottom. Have all material at hand and measured. Use a round bottom bowl, and a wooden spoon for mixing; beat rather than stir the mixture and fold in ingredients. Put mixture in cake pans, slightly higher on the sides than in the center, as cake rises more quickly in the center. Layer cake takes a hotter oven than loaf cake. If cake is baked properly, it will rise, but not brown, during first quarter of the time required for baking; become slightly browned the second quarter; well browned during the third; and shrink from the pan during the fourth.

If the oven is too hot, a crust will form over the top before the cake has risen sufficiently and the cake will break

open on the top. If the oven is too cool the cake will rise too much and will be of coarse texture.

Place pans in oven in such position that they may remain and do not move them before the third quarter of the baking. If the top of the cake should brown too quickly cover with a piece of light weight paper, slightly buttered on the one side and next to the cake.

Cake is sufficiently baked when it shrinks slightly from the edge of the pan and feels firm to the touch; if when tested with a fine washed and heated knitting or darning needle and it comes out clear. In looking at cake do not open the oven door too wide and only for a moment, and care must be taken not to jar the door in closing.

SPONGE CAKE, 1390 CALORIES

4 eggs.
1 cup powdered sugar.
¾ cup bread flour.
½ teaspoon salt.
1½ level teaspoons Rumford's baking powder.
Rind and juice of ½ lemon.

Beat eggs separately, very light. To the yolks add the sugar and lemon, sift in carefully the flour blended with the baking powder and beat about five minutes. Then fold in the whites. Bake in a well-greased and floured angel cake tin in a moderate oven. Cake is done if when tested with a fine (washed) knitting needle it comes out clear, or when the cake shrinks from the pan.

COLD WATER SPONGE CAKE, 1633 CALORIES

2 eggs.
1 cup sugar.
6 tablespoons cold water.
1⅓ cups bread flour.
2 level teaspoons Rumford baking powder.
1 tablespoon lemon juice.

Beat the yolks and whites separately. To the yolks add the sugar and beat well; add lemon juice and cold water; sift flour and baking powder together three times and add gradually, beating thoroughly.

Fold in the well-beaten whites. Bake in well-greased and floured gem tins, or shallow pan in a moderate oven.

HOT WATER SPONGE CAKE, 1460 CALORIES

2 eggs.
1 cup sugar.
1 cup bread flour.
1¼ level teaspoons Rumford baking powder.
½ saltspoon salt.
½ teaspoon vanilla.
½ cup boiling water.

Beat the eggs very light, add the sugar; sift dry ingredients together and add gradually; add flavoring and beat well. Lastly add the boiling water, and bake in well-greased and floured gem tins, or shallow pan, in a moderate oven.

PLAIN CAKE, 2230 CALORIES

2 eggs.
½ cup milk.
1 cup sugar.
1½ cups bread flour blended with 2 tablespoons corn-starch.
4 tablespoons butter.
2 level teaspoons Rumford baking powder.
1 teaspoon flavoring or spices.

Line the pan with buttered paper; separate eggs. Cream the butter, add the sugar gradually, add the well-beaten yolks and flavoring. Add alternately the milk and the flour with the baking powder sifted in it. Beat well and fold in the stiffly-beaten whites. Put at once in a well-lined and greased pan, and bake in a hot oven about thirty minutes, or until it shrinks from the pan, or until a fine (washed) knitting needle comes out dry.

The cake may be varied by adding one-fourth cup currants, or a few raisins and a little citron, or mixed spices, or a little melted chocolate. Before adding fruit to cake it should be slightly floured.

GLUTEN NUT CAKE (FOR THE DIABETIC), 1436 CALORIES[1]

1 tablespoon butter.
Yolks 2 eggs.
Whites 2 eggs.
⅔ cup sour milk.
1 teaspoon soda.
½ teaspoon Sweetina.
Salt and spices.
1 cup nut meats.
Gum Gluten Flour.

Cream the butter, add the well-beaten yolks and Sweetina syrup, then the sour milk in which the soda has been blended. Add Gum Gluten Flour gradually to make a stiff batter;

[1] Without gluten flour.

season with salt and spices and add nut meats. Bake in moderate oven.

BOILED FROSTING, 853 CALORIES

1 cup sugar.	White 1 egg.
¼ teaspoon cream of tartar.	¼ teaspoon flavoring.
⅓ cup cold water.	

Boil the sugar, cream of tartar and cold water without stirring until it threads from spoon, and gradually pour on to the well-beaten white of egg. Add any flavoring to taste. Beat until thick and spread quickly. A little chocolate may be added for variety, or chopped nuts or cocoanut, etc.

MARGUERITE WAFERS

Take "Long Branch" wafer crackers and spread with plain-boiled frosting, or add nuts, chocolate, cocoanut, etc. Put in oven a moment to dry, but not brown. Dainty to serve with Ice Cream, Ices and Sherbet.

GINGER BREAD, 2600 CALORIES

1 egg.	½ cup boiling water.
1 cup molasses.	1 teaspoon ginger.
7 tablespoons melted butter.	1¾ cups bread flour or
1 teaspoon soda.	2¾ cups pastry flour.

Beat egg in mixing bowl; add molasses, melted butter, and gradually one cup of flour. To the remaining flour add the soda and ginger, sift and add to mixture; beat well and add the boiling water. Bake in well-greased and floured gem tins, or shallow pan, in a hot oven about twenty minutes. Test with a fine (washed) darning needle; when it comes out clear, or the cake shrinks from the pan the cake is done.

PART III

HOSPITAL DIETARIES

DIET IN DISEASE

DIET IN SPECIAL CONDITIONS

CHAPTER XIII

HOSPITAL DIETARIES

GENERAL TYPES OF DIET USED IN HOSPITALS

LIQUID OR FLUID DIETS

Foods to be Used. Acid, starchy and miscellaneous beverages (note various chapters for recipes). Raw eggs in combination with water, milk, fruit juices, cocoa, or other fluids (note chapter Albuminous Beverages). Milk either plain or modified in different ways as given in recipes under chapter; thus milk may be flavored with cocoa, chocolate, coffee or meat broth; diluted with lime water, White Rock or Vichy; combined with starchy drinks or strained gruels. Broths of various kinds; beef juice; beef tea; beef extract. Soups, both clear and creamy.

LOW FLUID DIET, 100–200 CALORIES

This consists practically of plain broths, clear soups, thin gruels, dilute fruit juices slightly sweetened, along with non-nutritious drinks, such as plain tea and coffee. These food articles are in reality not given for their very slight nutritive value, but because they are palatable and at the same time enable the stomach to rest for a day or two. Thus the patient receives a liberal daily supply of water (two or three pints) in a bland and agreeable form.

FLUID DIET WITHOUT NUTRITIVE VALUE

Dr. Max Einhorn [1]

8 A. M.	Tea or Coffee 1–2 cups	250–500 C.C.
12 M.	Bouillon 1–2 cups	250–500 C.C.
4 P. M.	Tea or Coffee 1–2 cups	250–500 C.C.

[1] Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School and Hospital; Physician to Post Graduate and German Hospital, 1917.

8 P. M.	Bouillon 1–2 cups ....250–500 C.C.	
	2 quarts of plain water, or White Rock, or Vichy should be consumed, in addition, in every 24 hours.	

FLUID DIET WITH LOW NUTRITIVE VALUE

Dr. Max Einhorn [1]

		Calories
8 A. M.	Tea or Coffee 1–2 cups ....250–500 C.C.	
	with one teaspoonful of sugar	16
12 M.	Thin Barley Gruel 10 ounces ...... 300 C.C.	
	1 tablespoonful Crushed Barley	50
4 P. M.	Bouillon 1–2 cups ....250–500 C.C.	
8 P. M.	Lemonade 1–2 cups ....250–500 C.C.	
	with one tablespoonful sugar	60
	Total	126

2 quarts of plain water, or White Rock, or Vichy, should be consumed, in addition, in every 24 hours.

MEDIUM FLUID DIET (HALF RATION), 800–900 CALORIES

This is intended for very brief use — a few days at most, to rest the digestive organs and prepare the patient for the full fluid regimen. The balance of the daily requirement must be borrowed from the patient's own tissues. This diet may be obtained from the following articles:

Milk	1½ pints (about)	400	calories
Meat Broth	1½ pints (about)	110	"
Cereal Flour for Gruel	1 tablespoon (about)	40	"
Sugar	4 tablespoons	240	"
Egg White	2	27	"
Lemon Juice	4 tablespoons	22	"
Coffee, tea, vichy, water (no fuel value)			
	Total	839	"

In arranging these food articles in a daily menu, individual feedings should be small and succeed one another every two hours (eight or nine feedings daily).

1 Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School and Hospital; Physician to Post Graduate and German Hospital, 1917.

MEDIUM FLUID DIET (HALF RATION)

Dr. Max Einhorn [1]

			Calories
8 A. M.	Milk	10 ounces 300 C.C.	202
10 A. M.	Milk and strained barley water, equal parts	10 ounces 300 C.C.	160
12 M.	Bouillon with the white of two eggs	10 ounces 300 C.C.	30
2 P. M.	Lemonade with 2 tablespoonfuls sugar	10 ounces 300 C.C.	120
4 P. M.	Milk	10 ounces 300 C.C.	202
6 P. M.	Bouillon with the whites of 2 eggs	10 ounces 300 C.C.	30
8 P. M.	Whey	10 ounces 300 C.C.	60
10 P. M.	Lemonade, with 2 tablespoonfuls sugar	10 ounces 300 C.C.	120
	Total		924

1 quart of water should be taken in addition in 24 hours.

FULL FLUID DIET

1800 Calories at least

The full fluid diet gives the full requirement for an adult in bed and can, if necessary, be used over long periods. It also serves as a preparation for semi-solid and convalescent diets. The calories may be derived as follows:

Milk	2½ pints	844	Calories
Extra Cream (thick)	3½ ounces	584	"
Sugar	3 tablespoons	180	"
Malted Milk	3 tablespoons	180	"
Egg	2	120	"
Egg White	1	14	"
Cereal Flour Gruel	1 tablespoon cereal flour	40	"
Grape Juice	2 ounces	60	"
Orange Juice	4 ounces	50	"
	Total	2072	"

A daily menu with eight or nine feedings, two hours apart may be arranged from the above materials.

1 Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School and Hospital; Physician to Post Graduate and German Hospital, 1917.

FULL FLUID DIET (FULL RATION)

Dr. Max Einhorn [1]

		Calories
8 A. M.	Milk 200 C.C. (6⅔ oz.), with Coffee 100 C.C. (3⅓ oz.), and Sugar 2 teaspoonfuls	160
10 A. M.	Bouillon and 1 Egg	82
12 M.	Milk 200 C.C. (6⅔ oz.), Cream 50 C.C. (1⅔ oz.), and Cereal 50 C.C. (1⅔ oz.)	426
2 P. M.	Milk 200 C.C. (6⅔ oz.), with Coffee 100 C.C. (3⅓ oz.) and Sugar 2 teaspoonfuls	160
4 P. M.	Milk 250 C.C. (8½ oz.), Cream 50 C.C. (1⅔ oz.)	296
6 P. M.	Milk 200 C.C. (6⅔ oz.) Tea 50 C.C. (1⅔ oz.) Cream 50 C.C. (1⅔ oz.) and Sugar 2 teaspoonfuls	328
8 P. M.	Milk 200 C.C. (6⅔ oz.) Cream 50 C.C. (1⅔ oz.) Cereal 50 C.C. (1⅔ oz.)	426
10 P. M.	Milk 300 C.C. (10 oz.)	192
	Total	2070

FULL FLUID DIET (SUITABLE FOR TYPHOID FEVER)

Dr. F. P. Kinnicutt [2]

1900 Calories with Low Fat

8 A. M.	Milk and coffee each	4 oz.	120 C.C.
10 A. M.	Milk, hot or cold	8 oz.	240 C.C.
12 M.	Oatmeal gruel	4 oz.	120 C.C.
	With milk	2 oz.	60 C.C.

[1] Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School and Hospital; Physician to Post Graduate and German Hospital, 1917.

[2] Dr. F. P. Kinnicutt, " Diet Lists of the Presbyterian Hospital," New York City, page 15.

2 P. M.	Milk	8 oz.	240 C.C.
4 P. M.	Oatmeal gruel	4 oz.	120 C.C.
	With milk	2 oz.	60 C.C.
6 P. M.	Custard with lactose	½ pint	
8 P. M.	Hot milk	8 oz.	240 C.C.
10 P. M.	Whey with one whole egg and sherry	6 oz.	180 C.C.
12 P. M.	Oatmeal gruel	4 oz.	120 C.C.
	Milk	2 oz.	60 C.C.
2 A. M.	Milk	8 oz.	240 C.C.
4 A. M.	Broth with 1 whole egg	8 oz.	240 C.C.
6 A. M.	Milk	8 oz.	240 C.C.

This diet is given in 12 feedings, every two hours, both day and night.

Approximate Values.— Protein, 98 gm. (3⅓ oz.); fat, 52 gm. (1⅔ oz.); carbohydrates, 150 gm. (5 oz.); calories, 1900.

HIGH CALORY FLUID DIET

When as a consequence of influenza or any severe mental strain there is a continuous loss of appetite, with complete repugnance to solid food, an individual may secure sufficient daily calories for leading a fairly active life through fluid diet in the form of egg nogs. One of the latter composed of 8 oz. of milk or thin cream with the addition of two eggs and one tablespoonful of sugar will yield from 350 to 600 calories, and one made of a mixture of equal parts of whole milk and thin cream will yield nearly 500 calories. If intended for brief use only, a few days at most, the occasional addition of an ounce of spirits will not only add nearly 100 extra calories, but will perhaps cause a slight desire for other foods, such as dipped toast. From 4 to 6 of these egg nogs daily, according to the food value will secure at least 2000 calories.

The high calory diet used in Typhoid Fever may be adapted to other conditions (note Chapter XIV).[1]

MILK DIET

Bellevue Hospital

During the day give 6 to 8 ounces every two hours.

During the night give 6 to 8 ounces every three hours.

[1] Page 342.

(When very ill give every two hours during the night.)

Three quarts with 3000 c.c.: Protein, 100 gm. (3⅓ oz.); fat, 120 gm. (4 oz.); carbohydrate, 150 gm. (5 oz.); calories, 2160; chlorids, 5.2 gm.

MODIFIED MILK FLUID DIET

Dr. W. Coleman [1]

See "Typhoid Fever," Page 342.

SOFT OR SEMI-SOLID DIET

Foods to be Used. All fluid foods. Milk and water gruels. Water, milk or creamy toast. Toast softened with broth. Starchy and meat jellies. Custards in various forms. Whips and soufflés. Junkets, cornstarch puddings or blanc-mange, gelatins jellies. Ice cream, sherbet, ices. Plain cream and butter. (Meats, fish, and green vegetables are to be omitted.)

Soft or Semi-Solid Diet. This differs from a full liquid diet in including a number of semi-solid dishes, and having generally a larger caloric value (2000–2200 calories). It must be simple, well cooked and attractively served, so as to be easy of digestion.

The following suggests some of the possibilities for arrangement of foods which are suitable for this type of diet:

TYPICAL MENU FOR A SOFT OR SEMI-SOLID DIET

Dr. Mary S. Rose [2]

2000–2200 Calories

7 A. M.	1 cup hot milk (may be flavored with tea or coffee).
9:30 A. M.	½ cup grape or pineapple juice.
	1 cup thick farina gruel served with rich milk.
	1 thin slice toast with butter.
12 Noon.	1 cup beef broth with the white of 1 egg.
	1 thin slice toast with butter.
2:30 P. M.	⅔ cup of chicken soufflé.
	½ thin slice toast.
	½ cup lemon jelly with 1 tablespoonful whipped cream.

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.
[2] Mary Swartz Rose, Ph.D., "Feeding the Family," The Macmillan Co., New York, 1917.

5 P. M.	1 cup milk flavored with tea or cocoa.
	½ thin slice toast.
7:30 P. M.	½ cup bouillon.
	1 egg omelet.
	½ cup cocoa or caramel junket.
10 P. M.	1 cup gruel or malted milk (made with milk).
	1 thin slice toast.

LIQUID AND SOFT-SOLID DIET

Massachusetts General Hospital [1]

For Typhoid Fever, Acute Infectious Diseases, Convalescence from Operation, Heart Decompensation.

FIRST DAY

8 A. M.	Wheat cereal (as wheat germ or shredded wheat) with cream or salt only. Milk, 4 ounces.
10–11 A. M.	Crackers and milk or eggnog.
1 P. M.	Pea or potato purée.
	Soft or cream toast.
	Soft boiled egg.
3–4 P. M.	Rice, tapioca or custard.
6 P. M.	Cereal or rice. Milk, 4 ounces.
8 P. M.	Crackers and milk.

Drinks — Grape juice, lemonade, orangeade, albumin water with sugar.

SECOND DAY

8 A. M.	Indian meal mush or Farina. Milk.
10–11 A. M.	Crackers and milk.
1 P. M.	Minced chicken, mashed potatoes.
3 P. M.	Chocolate or crackers and milk.
6 P. M.	Cream toast. Ice cream or custard.
9 P. M.	Crackers and milk or malted milk.

THIRD DAY

8 A. M.	Cerealin. Milk.
10–11 A. M.	Malted milk or crackers and milk.
1 P. M.	Soft boiled eggs, rice, apple sauce.
3–4 P. M.	Cornstarch or custard.
6 P. M.	Potato purée, toast.
9 P. M.	Crackers and milk.

[1] Diet used at the Massachusetts General Hospital, Boston, 1917.

LIGHT OR CONVALESCENT DIET

A simple mixed diet is suitable for convalescence. Foods recognized as difficult of digestion should be avoided, and emphasis laid on milk, eggs, toast, well cooked cereals, and other foods used in Soft Diet, mild fruits and well-cooked vegetables may be added cautiously and tender meat about once a day. The fuel value should be liberal, probably 2200 to 2500 calories per day.

DIET FOR CONVALESCENTS

Dr. Max Einhorn [1]

Breakfast	2 soft boiled or poached eggs.
	Toast and butter.
	Coffee with milk and sugar.
10:30 A. M.	Egg nog.
	Crackers and butter.
Lunch	Cream soup, or meat soup.
12:30	White bread and butter.
	Tender meat.
	Mashed or baked potato.
	Spinach or cauliflower.
	Custard or tapioca pudding.
3:30 P. M.	Egg nogg.
	Crackers and butter.
6:30 P. M.	Fish or oysters.
	Scrambled or coddled eggs or omelette.
	Toast and butter.
	1 cup weak tea with milk and sugar.
	Rice or tapioca pudding.
9:30 P. M.	1 glassful of milk, or kumyss.
	Crackers and butter.

GENERAL CONVALESCENT DIET

New York Hospital [2]

6 a. m.— Milk, 7 oz. (210 c.cm.) if desired.

Breakfast.— Coffee or tea with milk and sugar, or milk; 1 egg, or fresh fish, or plain stew; cereal with milk and sugar; toast and butter or rolls or bread (white, graham or brown).

Dinner.— Broth or soup with barley or vegetables; bread and but-

[1] Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School and Hospital; Physician to Post Graduate and German Hospital, 1917.

[2] Modified from New York Hospital Diets by Herbert S. Carter, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Sanders Co., Philadelphia, Pa.

ter; milk; potatoes (baked, boiled or mashed); rice, macaroni or hominy; beef, chicken or fish; pudding, ice cream or fruit.

Supper.— Tea or milk; toast and butter or bread; cooked fruit apples, stewed or baked, prunes, rhubarb, apricots or pears; egg.

8 p. m.— Milk, 210 c.c. (7 oz.). Total quantity of milk allowed should not exceed 2½ pints (1250 c.c.).

SPECIAL CONVALESCENT DIET

New York Hospital [1]

SUNDAY

Breakfast.— Wheatena, 1 egg.
Dinner.— Chicken, baked potato, orange.
Supper.— Egg, prunes.

MONDAY

Breakfast.— Hominy, stew.
Dinner.— Roast beef, mashed potato, rice pudding.
Supper.— Eggs, pears or apricots.

TUESDAY

Breakfast.— Oatmeal, 1 egg.
Dinner.— Fresh fish, boiled potato, hominy, ice cream.
Supper.— Egg, stewed apples.

WEDNESDAY

Breakfast.— Wheatena, fresh fish.
Dinner.— Chicken, baked potato, macaroni, tapioca pudding.
Supper.—Egg, rhubarb or prunes.

THURSDAY

Breakfast.— Hominy, 1 egg.
Dinner.— Boiled beef, mashed potato, rice, baked custard.
Supper.— Egg, baked apple.

FRIDAY

Breakfast.— Oatmeal, 1 egg.
Dinner.— Fresh fish, boiled potato, macaroni, ice cream.
Supper.— Egg, prunes.

SATURDAY

Breakfast.— Cornmeal, stew.
Dinner.— Chicken, mashed potato, hominy, cornstarch pudding.
Supper.— Egg, apricots or pears.

[1] Modified from New York Hospital Diets by Herbert S. Carter, " Diet Lists of the Presbyterian Hospital," New York City. U. B. Sanders Co., Philadelphia, Pa.

APPROXIMATE VALUES TO BE GIVEN

	Protein	Carbohydrate	Fat	Total Calories
Men	100 gm. (3⅓ oz.)	300 gm. (10 oz.)	90 gm. (3 oz.)	2500
Women .	80 gm. (2⅔ oz.)	300 gm. (10 oz.)	80 gm. (2⅔ oz.)	2200

REGULAR HOUSE DIET

New York Hospital[1]

The regular house diet in institutions comprises a great variety of dishes, so that it is always possible to consult economy in making a selection. It consists of a general plan of feeding, in which general terms like soup, meat, cereal, fruit, puddings are set down, together with beverages and bread and butter. The special diet gives the particular cereal, soup, etc., for each day and meal. There is, however, no absolute distinction between the two diets, for as will be noted, the general plan contains certain special dishes which do not appear in the special diets.

GENERAL HOUSE DIET

Breakfast.— Coffee or tea with milk or sugar, or milk; bread and butter; eggs; cereal with milk or sugar; fresh fish; hash.
Dinner.— Soup; meat or fish; potatoes (baked, boiled or mashed); one of the following vegetables: spinach, squash, boiled onions, beets, sweet potatoes, macaroni, tomatoes, corn; bread and butter; milk 180 c.c. (6 oz.); pudding or fruit.
Supper.— Tea or milk; bread and butter; cooked fruit (prunes, apples or rhubarb); apricots, pears; cold meat; egg; cereal with milk and sugar; milk toast.

The total quantity of milk allowed should not exceed 1½ pints. Male ward patients are allowed two eggs, females, one egg.

SPECIAL HOUSE DIET

SUNDAY

Breakfast.— Wheatena, eggs.
Dinner.— Chicken, tomatoes, baked potatoes, fresh fruit.
Supper.— Cold meat, prunes.

[1] Modified from New York Hospital Diet Lists by Dr. Herbert S. Carter, "Diet Lists of the Presbyterian Hospital," New York City. W. B. Sanders Co., Philadelphia, Pa.

MONDAY

Breakfast.— Hominy, bacon.
Dinner.— Vegetable soup, roast mutton, spinach or corn, mashed potatoes, rice pudding.
Supper.— Eggs, apricots.

TUESDAY

Breakfast.— Oatmeal, eggs.
Dinner.— Lamb stew, boiled potatoes, beets, sago pudding.
Supper.— Cereal with milk and sugar, apples.

WEDNESDAY

Breakfast.— Wheatena, fresh fish.
Dinner.— Chicken, baked potatoes, boiled onions, baked apples.
Supper.— Cold meat, rhubarb or prunes.

THURSDAY

Breakfast.— Hominy, eggs.
Dinner.— Pea soup, roast mutton, mashed potatoes, squash, bread pudding.
Supper.— Milk-toast, baked apple.

FRIDAY

Breakfast.— Oatmeal, egg.
Dinner.— Fish, boiled potatoes, macaroni and tomatoes, rice pudding.
Supper.— Eggs, prunes.

SATURDAY

Breakfast.— Cornmeal, hash.
Dinner.— Vegetable soup, meat stew, mashed potatoes, spinach or corn, cornstarch pudding.
Supper.— Eggs, apricots or pears.

APPROXIMATE VALUES TO BE GIVEN

	Protein	*Carbohydrates*	*Fat*	*Total Calories*
Men ...	90 gm. (3 oz.)	300 gm. (10 oz.)	70 gm. (2⅓ oz.)	2200
Women	80 gm. (2⅔ oz.)	250 gm. (8⅓ oz.)	60 gm. (2 oz.)	1800

CHAPTER XIV

DIET IN DISEASE

One of the most striking differences between the older and more recent methods of treatment of disease is the careful attention bestowed upon the diet at the present day. For it is now recognized that the proper selection of food, both solid and fluid, is of as much importance as the use of medicaments. In the management of diseases affecting the digestive organs proper, and in all affections of metabolism (gout, obesity and diabetes, for example) the diet may be said to represent the treatment, and there is hardly any disease which may not be benefited by intelligent feeding.

These matters, however, are left entirely to the medical practitioner, and it is only exceptionally that the nurse is required to assume any responsibility. She should know in a general way, however, the types of food suitable in different diseased conditions, so that she may avoid harmful foods when not given specific instructions, and so that she may adapt the prescribed diet to the tastes of the individual. For this purpose, an outline of the diets in use in common diseases is included in this volume.

DIET IN FEVERS AND INFECTIOUS DISEASES

DIET IN FEVER IN GENERAL

In fevers due to poisons circulating in the blood, there is an interference with heat regulation, so that the heat generated in the body cannot be gotten rid of in the normal way; an increased metabolism; and a disturbance of the digestive functions especially in the early stages. It is, therefore, desirable to give easily digested food, in small quantities

at frequent intervals, preferably in liquid form, as substances dissolved in water are more readily absorbed, and water tends to aid in cooling the body to normal temperature.

For the first three or four days, patients previously strong, should be given only fluid foods. But since a normal man, lying quietly in bed, requires about 2000 calories to compensate for daily loss of energy, and in the increased metabolism of fever, this requirement is increased, it is necessary that more substantial food be incorporated into the diet as far as is possible without disturbing digestion.

DIET.— Milk is the staple food, but must be given with care, swallowed very slowly and diluted with limewater, soda, seltzer or other effervescent water — one part to two parts milk.

If milk can be taken, two or three pints should be given — four ounces every two hours, or six ounces every three hours. In case milk does not agree, whey may be given as a substitute for milk in part or in whole. Modified milk or peptonized milk may be given. Sometimes the milk may be flavored with tea, coffee, cocoa or malted milk and junket used.

Next to milk the most important article of diet is beef juice and broths. Next come well cooked gruels. Later well prepared cereals and malt extract are valuable, and plain or cocoa junkets. Usually there is thirst, and all acid drinks, such as grape juice, may be taken.

Panopepton with crushed ice, peptonised milk, clam, mutton and chicken broth, beef tea, clear soups, thickened with some farinaceous substance, gelatin jellies, are all of value.

Liquids.— Pure cold water, toast water, any of the acid drinks, all sipped slowly, are recommended both to relieve thirst and on account of facilitating the speed with which the waste matter resulting from increased metabolism of the fever is eliminated through the kidneys.

AVOID.— Any solid or vegetable food or fruits, until permitted by the physician in charge.

DIET IN CONVALESCENCE FROM FEVER

Thompson [1]

Convalescents who have long subsisted solely upon fluids must be careful in resuming solid diet, for the rapidity of recuperation of the digestive organs varies in different per-

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

sons, and taking meats or other solid foods too soon may cause rise in temperature, rapid heart action, and possibly visceral congestion. The first meat given, therefore, should be in a finely subdivided state, such as scraped beef or minced chicken.

During convalescence from protracted fevers the more easily digested forms of starchy foods are found to be very useful, especially if there has been much loss of weight. Sago and tapioca, and dried bread crumbs rolled through a fine sieve may be added to thicken clear meat broths. Crackers and zwieback are useful.

Other ingredients which may be added to thicken soups during convalescence are panada, semolina, tapioca, and macaroni. Custard puddings, cooked fruit, wine and beef jellies, blanc-mange, or baked custard, may be allowed. "Mush," fine hominy, cornstarch, farina, and boiled rice, with beef juice, can be ordered.

The following dietary will serve as a general guide for feeding convalescents from fevers of ordinary severity in which special lesions of the alimentary canal are not present.

FIRST DAY

Breakfast.— Poached egg on toast. Cocoa.
Lunch.— Milk punch.
Dinner.— Raw oysters. Cream crackers. Light wine if desired.
Lunch.— One cup of hot meat broth.
Supper.— Milk toast. Wine jelly. Tea.

SECOND DAY

Breakfast.— Soft cooked egg. Milk punch. Coffee with sugar and cream.
Lunch.— One cup of soft custard.
Dinner.— Cream of celery soup. Sippets of toast. A little barley pudding, with cream. Sherry wine if desired.
Lunch.— Milk punch.
Supper.— Water toast, buttered. Wine jelly. Tea.

THIRD DAY

Breakfast.— Coddled eggs. Cream toast. Cocoa.
Lunch.— One cup of hot chicken broth.
Dinner.— Chicken panada. Bread. Light wine if desired. A little tapioca cream.

Lunch.— An eggnog.
Supper.— Buttered dry toast. Baked sweet apples and cream. Tea.

FOURTH DAY

Breakfast.— An orange. Oatmeal (H. O.), with cream and sugar. Poached egg on toast. Baked potato. Cocoa.
Lunch.— One cup of hot, soft custard.
Dinner.— Potato soup. Croûtons. A small piece of beefsteak. Creamed potatoes. Baked custard. Coffee.
Lunch.— One cup of chicken broth, with rice.
Supper.— Raw oysters. Banquet crackers. Graham bread, toasted Wine jelly. Tea.

FIFTH DAY

Breakfast.— An orange. Coffee. Oatmeal, with cream and sugar Broiled mutton chop. Toast.
Lunch.— One cup of mulled wine.
Dinner.— Chicken soup. Bread. Creamed sweetbreads. Duchess potatoes. Snow pudding. Cocoa.
Lunch.— Siphon soda, with coffee syrup and cream.
Supper.— Buttered dry toast. Orange jelly. Sponge cake and cream. Tea.

The reader is referred to the general discussion of Convalescence Diet given under Hospital Dietaries. Page 330.

TYPHOID FEVER

The modern dietetics of typhoid fever has undergone a rather radical change in the light of the very significant work done by physicians [1] in the past few years. There is no longer any necessity for giving the starvation treatment. A fluid diet is advisable at first, and perhaps for some time during the febrile period. As soon as the individual patient is in a fit condition, however, soft diet yields the best results.

As in the past, constant attention from the physician and nurse is a most important factor. A schedule must be worked out for each patient, and then strictly adhered to by the nurse. All developments must be carefully watched, noted and cared for, chiefly by an alteration in the diet.

1 Dr. W. Coleman, Bellevue Hospital, New York City; Dr. Eugene F. DuBois, Med. Director, Bellevue Hospital; Dr. B. B. Crohn, Mt. Sinai Hospital, New York; Dr. Kelly, Dr. LaFetra, Dr. Shroeder and others.

The first important clinical evidence of the value of a liberal diet, is that given by Dr. Shattuck.[1]

"When typhoid kills, it does so either by perforation or exhaustion. The main factors in producing exhaustion, which causes the death of at least nine-tenths of the fatal cases, are toxemia, continued fever, diarrhea and vomiting, and intestinal hemorrhage."

"Most of us are agreed that we are not as yet acquainted with any therapeutic measures which either abort or very materially shorten the course of the disease. We are, I think, unanimous in believing that husbanding the strength from the start through skillful nursing, the judicious use of water externally and internally, and the supervision of a wise attendant on the watch for and prepared to meet such indications as may arise, materially modifies the course of the disease and lessens its mortality. If what I have assumed to be facts be really facts, the question of diet must be a very important one in the management of typhoid fever. It is through the food which is assimilated, not through that which is merely put into the stomach, that we seek to limit the tissue waste while the process is active, and also try to land the patient on the low shore of convalescence with as much of his property as may be; for the recovery of his property is a necessary preliminary to the attainment of the high tableland of full health."

"I may perhaps add here that diarrhea is not nearly as constant a symptom in typhoid fever as the books lead students to believe. In at least 50 per cent. of my hospital cases no diarrhea was present at any time. We must therefore have reference to the local intestinal lesions as well as to the general state. In a disease of such long course it is impossible to prevent accidents by putting the bowels in splints, even if it were desirable to do so. More or less peristalsis

[1] Dr. Frederick C. Shattuck. From a paper on "Liberal Diet in Typhoid Fever," read by title in the Section of Practice of Medicine at the 48th Annual Meeting of the American Medical Association at Philadelphia, Pa., June, 1897. Corroborated in Vol. II — "Therapeusis of Internal Diseases" — edited by Forcheimer — 1913. Pages 11–16.

must go on, and waste matter must pass over the ulcerated surfaces; and how deep or extensive the ulcerated surface may be in any particular case no symptom or group of symptoms enables us to measure. Hence, it seems rational, quite apart from the fever, to withhold from the diet any articles the residue of which is liable to irritate either the mucous membrane in general or the ulcerated portion in particular. This would seem a fair explanation for the popularity of milk as a diet for typhoid, containing as it does a large proportion of water, and every principle necessary to nutrition, so combined as to make relatively small demands on the digestion of most persons, and leaving a residue which, though notoriously large, is not mechanically irritating. The objection to milk is that it is repugnant to a few persons, and becomes either repugnant or monotonous to a considerable number sooner or later. It is not necessary here to specify the many expedients which may and often must be resorted to to overcome this objection, and in some cases to render it digestible whether palatable or not. Milk is likely to maintain a very important, perhaps leading place in the diet of typhoid, as well as of other diseases and conditions."

"During the twelve years, 1886 to 1897 (both inclusive), 380 cases of typhoid fever have come under my personal care in the Massachusetts General Hospital. From 1886 to 1893, 233 cases were treated under a milk diet, with a mortality of 10 per cent. From 1892 to 1897, 147 cases have been treated under a much more extended diet with a mortality of 8.1 per cent. I know well the liability to reach false conclusions in reasoning from too small figures in a disease like typhoid fever. And it is also true that water has been used more efficiently of late than in former years. But I can see nothing in my figures to contravene my observation that an enlarged diet has not been injurious. I would not be understood as advocating an indiscriminate diet. My plea is simply for treating the patient rather than the disease; for feeding him with reference to his digestive power rather than solely

or mainly with reference to his fever; for the view that the danger of accidents from the local intestinal ulceration is not increased by allowing him to partake of articles which leave no irritating residue, and which cautious trial shows are digested without disturbance or discomfort."

Through observing some patients, to whom, because of great weakness, a full diet was given, Dr. Shattuck found that the increased diet, led to a happier and more rapid convalescence, and consequently, enlarged his dietetic treatment for all subsequent cases.

It seems strange that this did not command wider attention, but a long habit is hard to overcome. Dr. Shattuck's views are now upheld by scientific as well as by clinical evidence. One of the most significant contributions to the science of feeding has been made by Dr. Coleman [1] and his associates, who have studied typhoid patients in a respiration calorimeter [2] (large enough to allow for a patient in bed) and in other ways determined accurately the effect of food. A sufficient number of cases has been studied to give us convincing evidence of the beneficial results of high feeding.

THE HIGH CALORY FEEDING [3]

Dr. Coleman estimated that the minimum daily requirement should be 40 calories per kilogram (2.2 pounds) of body weight — that is 3000 calories for a man of 70 kilograms (154 pounds). This diet did not prevent loss of body weight. To prevent loss, from 60 to 80 calories per kilogram are needed. The optimum amount must be determined for each patient.

Those foods which are easy of digestion and of high nutritive value, are used. Carbohydrate foods contribute about half in point of calories. Sugar in the form of lactose (milk

1 Dr. W. Coleman, Bellevue Hospital, New York City; Dr. Eugene F. DuBois, Med. Director, Bellevue Hospital; Dr. B. B. Crohn, Mt. Sinai Hospital, New York; Dr. Kelly, Dr. LaFetra, Dr. Shroeder and others.

2 The Respiratory Calorimeter at Bellevue Hospital, New York.

3 Dr. W. Coleman, "The High Calory Diet in Typhoid Fever," *American Journal of Medical Sciences*, Jan., 1912, and other papers by him and his colleagues.

sugar) is the best, as it is less inclined to ferment, and more can be taken because of its lack of sweetness.

Protein has the same drawbacks in fever as in health, and should be limited to from 60 to 90 grams per day. Dr. Coleman does not advocate the use of meat as a source of protein. Enough can be obtained elsewhere, and meat is more liable to putrefaction.

Fat is of great value, especially after the first few days of the febrile period, and during convalescence. It has a tendency to cause nausea or diarrhea if given in excess.

Each patient must be studied to find out his maximum. Fat should be given in an emulsified form, as cream, butter or egg-yolk.

The patient should first be put on a low liquid diet (not lower than 1000 calories, however) until any undesirable condition may be corrected. Then as rapidly as possible the fluid diets higher in fuel value and then soft diet, are used, until the patient's maximum capacity is reached. In the cases studied and reported, the various doctors[1] have experienced little difficulty from the patient himself. Some have taken food amounting to 6000 calories a day, without special urging.

The advantages from this purely dietetic treatment of typhoid, seem to be many. The patients are contented, almost free from delirium, and not more liable to relapse. Abdominal distension, and diarrhea, which were considered symptoms of the disease, have ceased. Body weight is either maintained or any loss is recovered before the patient leaves the hospital. The long slow convalescence has apparently disappeared.

From this, at least some of the causes of death from exhaustion, mentioned above, are eliminated.

[1] Dr. W. Coleman, Bellevue Hospital, New York City; Dr. Eugene F. DuBois, Med. Director, Bellevue Hospital; Dr. B. B. Crohn, Mt. Sinai Hospital, New York City; Dr. Kelly, Dr. LaFetra, Dr. Shroeder and others.

MODIFIED MILK FLUID DIETS FOR TYPHOID FEVER

Dr. W. Coleman [1]

For the convenience of those desiring to use the high calory diet, the following combinations of foods are given. They are especially useful in the early stages of the disease, or in the case of patients who are unable to take solid food.

	Calories
For 1000 *calories a day:*	
Milk, 1000 c.c. (1 quart)	700
Cream, 50 c.c. (1⅔ oz.)	100
Lactose, 50 gm. (1⅔ oz.)	200
This furnishes eight feedings, each containing:	
Milk, 120 c.c. (4 oz.)	80
Cream, 8 gm. (2 dr.)	15
Lactose, 6 gm. (1½ dr.)	24
For 1500 *calories a day:*	
Milk, 1500 c.c. (1½ quarts)	1000
Cream, 50 c.c. (1⅔ oz.)	100
Lactose, 100 gm. (3⅓ oz.)	400
This furnishes six feedings, each containing:	
Milk, 240 c.c. (8 oz.)	160
Cream, 8 gm. (2 dr.)	15
Lactose, 16 gm. (4 dr.)	64
For 2000 *calories a day:*	
Milk, 1500 c.c. (1½ quarts)	1000
Cream, 240 c.c. (8 oz.)	500
Lactose, 120 gm. (4 oz.)	500
This furnishes seven feedings, each containing:	
Milk, 210 c.c. (7 oz.)	140
Cream, 30 c.c. (1 oz.)	60
Lactose, 18 gm. (4½ dr.)	72
For 2500 *calories a day:*	
Milk, 1500 c.c. (1½ quarts)	1000
Cream, 240 c.c. (8 oz.)	500
Lactose, 240 gm. (8 oz.)	1000
This furnishes seven feedings, each containing:	
Milk, 210 c.c. (7 oz.)	140
Cream, 30 c.c. (1 oz.)	60

[1] Dr. W. Coleman, "American Journal of Medical Sciences," Lea & Febiger, Philadelphia, Pa., January, 1912.

Lactose, 36 gm. (9 dr.)[2]	144
For 3000 *calories a day:*	
Milk, 1500 c.c. (1½ quarts)	1000
Cream, 480 c.c. (1 pint)	1000
Lactose, 240 c.c. (8 oz.)	1000
This furnishes eight feedings, each containing:	
Milk, 180 c.c. (6 oz.)	120
Cream, 60 c.c. (2 oz.)	120
Lactose, 30 gm. (1 oz.)	120
For 3900 *calories a day:*	
Milk, 1500 c.c. (1½ quarts)	1000
Cream, 480 c.c. (1 pint)	1000
Lactose, 480 gm. (16 oz.)	1900
This furnishes eight feedings, each containing:	
Milk, 180 c.c. (6 oz.)	120
Cream, 60 c.c. (2 oz.)	120
Lactose, 60 gm. (2 oz.)	240

"When the above combinations are employed, it is generally desirable to add eggs to the diet in order to raise the nitrogen to the desired amount. The eggs may be soft-boiled or be shaken up in any of the above feedings unless distasteful to the patient, though the addition of an egg makes the stronger mixtures very rich. I have given some patients who seemed unable to get enough to eat 4 ounces of milk, 4 ounces of cream, 2 ounces of milk sugar, and an egg at a feeding. Such patients, however, are exceptional.

"Milk toast, with the addition of butter or cream, is relished by many patients.

"The following menus were arranged by Miss Mary E. Sheehan, head nurse in Ward AI of Bellevue Hospital, and have been employed, with such modifications as individual patients required, for the last two years. They may be followed in general at any stage of the disease if the patient is capable of taking solid and semi-solid food, and if he is hungry, but are most useful in the later stages, and in convalescence. The night-feedings are given when the patients' temperature are taken in the course of the ward routine."

2 If this and the following combinations are too sweet, a portion of the milk-sugar may be given in some other form.

A SOFT DIET FOR TYPHOID OR TYPHOID CONVALESCENCE [1]

(3911 Calories)

		Calories
7 A. M.	Egg, 1	80
	Toast, 1 slice	80
	Butter, 20 grams	150
	Coffee	
	Cream, 2 ounces	120
	Lactose, 20 grams	80
9 A. M.	Milk, 6 ounces	123
	Cream, 2 ounces	120
	Lactose, 10 grams	40
11 A. M.	Egg, 1	80
	Mashed potato, 20 grams	20
	Custard, 4 ounces	250
	Toast (or bread) 1 slice	80
	Butter, 20 grams	150
	Coffee	
	Cream, 2 ounces	120
	Lactose, 20 grams	80
1 P. M.	Same as 9 A. M.	283
3 P. M. [2]	Same as 9 A. M.	283
5 P. M.	Egg, 1	80
	Cereal, 3 tablespoons	150
	Cream, 2 ounces	120
	Apple sauce, 1 ounce	30
	Tea	
	Cream, 3 ounces	180
	Lactose, 20 grams	80
7 P. M.	Same as 9 A. M.	283
10 P. M.	Same as 9 A. M.	283
1 A. M.	Same as 9 A. M.	283
4 A. M.	Same as 9 A. M.	283
	Total Calories for day	3911

A SOFT DIET FOR TYPHOID CONVALESCENCE [3]

(4835 Calories)

		Calories
7 A. M.	Egg, 1	80
	Toast, 2 slices	160

[1] Dr. W. Coleman, *American Journal of Medical Sciences*, Lea and Febiger, Philadelphia, Pa., January, 1912.
[2] Lactose lemonade may be substituted for the milk mixture at three o'clock.
[3] Dr. W. Coleman, *American Journal of Medical Sciences*, January, 1912.

A SOFT DIET FOR TYPHOID CONVALESCENCE

Dr. F. P. Kinnicutt

(4835 Calories)

		Calories
	Butter, 20 grams	150
	Coffee	
	Cream, 3 ounces	180
	Lactose, 20 grams	80
9 A. M.	Milk, 5 ounces	105
	Cream, 2 ounces	120
	Lactose, 15 grams	60
11 A. M.	Eggs, 2	160
	Toast, 2 slices	160
	Butter, 20 grams	150
	Mashed potato, 70 grams	70
	Custard, 8 ounces	500
1 P. M.	Same as 9 A. M.	285
3 P. M.	Same as 9 A. M.	285
5 P. M.	Egg, 1	80
	Toast, 2 slices	160
	Butter, 20 grams	150
	Cereal, 6 tablespoonfuls	290
	Cream, 4 ounces	240
	Apple sauce, 1 ounce	30
	Tea	
	Cream, 2 ounces	120
	Lactose, 20 grams	80
7 P. M.	Same as 9 A. M.	285
10 P. M.	Same as 9 A. M.	285
1 A. M.	Same as 9 A. M.	285
4 A. M.	Same as 9 A. M.	285
	Total Calories for the day	4835

OTHER TYPHOID DIETS USED WITH SUCCESS

Where it is not necessary to adhere strictly to the Modified Milk Diet the kinds of food in the fluid diet may be varied as follows:

A MIXED FLUID DIET FOR TYPHOID FEVER (NO. 1) [1]

Dr. F. P. Kinnicutt

(1900 Calories)

8 A. M. Milk and coffee, each 120 c.c. (4 oz.)
10 A. M. Milk, hot or cold, 240 c.c. (8 oz.).
12 NOON Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
2 P. M. Milk, 240 c.c. (8 oz.).

[1] Dr. F. P. Kinnicutt, "Diet Lists of the Presbyterian Hospital." New York.

4 P. M. Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
6 P. M. Custard with lactose (full cup).
8 P. M. Hot milk, 240 c.c. (8 oz.).
10 P. M. Whey, 180 c.c. (6 oz.), with one whole egg and sherry.
12 P. M. Oatmeal gruel, 120 c.c. (4 oz.), milk, 60 c.c. (2 oz.).
2 A. M. Milk, 240 c.c. (8 oz.).
4 A. M. Broth, 240 c.c. (8 oz.), with one whole egg.
6 A. M. Milk, 240 c.c. (8 oz.).

APPROXIMATE VALUES

Protein, 98 gm. (3⅓ oz.); fat, 52 gm. (1⅔ oz.); carbohydrates, 150 gm. (5 oz.); calories, 1900.

A MIXED FLUID DIET FOR TYPHOID FEVER (NO. 2) [1]

Dr. F. P. Kinnicutt

(2300 Calories. Lower Protein)

8 A. M. Milk and coffee, each 120 c.c. (4 oz.).
10 A. M. Milk, hot or cold, 240 c.c. (8 oz.).
12 NOON Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
2 P. M. Junket with cane- and milk-sugar.
4 P. M. Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
6 P. M. Junket with cane- and milk-sugar.
8 P. M. Hot milk, 240 c.c. (8 oz.).
10 P. M. Whey, 180 c.c., with one whole egg and sherry.
12 P. M. Oatmeal gruel, 120 c.c. (4 oz.), with milk, 60 c.c. (2 oz.).
2 A. M. Junket with cane- and milk-sugar.
4 A. M. Milk, 240 c.c. (8 oz.).
6 A. M. Milk, 240 c.c. (8 oz.).
15 gm. (½ oz.) of lactose added to the four milk feedings.

APPROXIMATE VALUES

Protein, 71 gm. (2⅓ oz.); fat, 81 gm. (2⅔ oz.); carbohydrates, 160 gm. (5⅓ oz.); calories, 2300.

These typhoid fluid diets can be further augmented by the addition of the following articles:

Lactose or cane-sugar, 30 gm. (1 oz.), 120 calories.
Pea soup, 180 c.c. (1 cup, 6 oz.), 192 calories (7.5 gm. protein).
Bean soup, 180 c.c. (1 cup, 6 oz.), 242 calories (12 gm. protein).
Soda cracker (one), 30 calories (.5 gm. protein).

$\left.\begin{array}{lll}\text{Cream} \ldots\ldots & 100\text{ c.c.} & (3\tfrac{1}{3}\text{ oz.}).\\ \text{Sugar or lactose} \ldots\ldots & 60\text{ gm.} & (2\text{ oz.}).\\ \text{Gruel} \ldots\ldots & 150\text{ c.c.} & (5\text{ oz.}).\end{array}\right\}\text{ 500 calories.}$

[1] Dr. F. P. Kinnicutt, "Diet Lists of the Presbyterian Hospital," New York.

This adds protein, 5 gm. (1/6 oz.); fat, 20 gm. (2/3 oz.); carbohydrates, 75 gm. (2½ oz.).

FOODS FROM WHICH A TYPHOID MIXED DIET MAY BE CHOSEN

Mary S. Rose, Ph.D.[1]

When the typhoid patient is not limited to a fluid diet, foods may be chosen from the following:

1. Milk in various forms.
2. Broths — beef, veal, chicken, mutton.
3. Soups — potato, pea, bean, carefully strained and thickened with flour, milk, cream, and egg may be used.
4. Gruels — always strained.
5. Eggs, raw or soft-cooked.
6. Cream and butter.
7. Custards, ice cream and sherbets, blanc manges, and gelatin jellies. Milk sugar used for sweetening will increase the fuel value.
8. Toast.
9. Breakfast cereals, thoroughly cooked and strained.
10. Rice, baked and mashed potatoes.
11. Apple sauce, orange juice and grape juice.

TONSILITIS AND QUINSY

Dr. Thompson[2]

Dietetic Treatment. These diseases require no special care in the acute stage, beyond giving food in such fluid form as can be most easily swallowed. The pain caused by this act is often so extreme that it is advisable to concentrate all food, to lessen the number of necessary acts of deglutition. Meat juice, petptonoids, beaten eggs and brandy, may be added to good milk. Plain vanilla ice cream may be given. Its coldness is sometimes soothing to the pharynx.

Holding cracked ice in the mouth before swallowing will sometimes annul the pain momentarily, or in extreme cases

[1] Mary Swartz Rose, Ph.D., "Feeding the Family," The Macmillan Co., New York, 1917.
[2] W. Gilman Thompson, M.D.: "Practical Dietetics," 1909. D. Appleton & Co., New York.

the pharynx and tonsils may be sprayed with cocaine, and the period of temporary anæthesia may be utilized for swallowing considerable nourishment. This is rarely necessary, for unless the patient is emaciated by previous serious illness, he is not apt to be in need of much food for a day or two. In bad cases of suppurative tonsilitis the strength suffers more, and stimulants may be given by the rectum if deglutition is impossible.

After all forms of tonsilitis there is apt to be considerable anæmia, and the patient for a week or two should eat abundantly of animal food. Egg-nog and milk punches are often needed for the first few days of convalescence.

DIPHTHERIA

Dr. Thompson [1]

Dietetic Treatment. "Alimentation occupies the first place in the general treatment" (Trousseau.) Throughout the active stage of the disease, while the fever lasts, there is difficulty in swallowing. All food should be given in fluid form, of which milk is best; or if as sometimes happens, semi-solid material is more easily swallowed, the food may be thickened with cream, gelatine, eggs or farinaceous articles; or beef meal, Malted milk, Mellen's food, or granum, etc., may be added for this purpose to other foods. The diet should consist chiefly of nutritious beef or chicken broth and beef tea, egg albumin, egg nog, milk and milk punch. Plain vanilla ice cream is nutritious, and if not too sweet, it is well borne, and is frequently very acceptable to the inflamed throat. Simple farinaceous foods, such as arrowroot, thoroughly cooked rice, soft cream toast and gruels may be taken. Continued disgust of food is a very bad prognostic sign and every effort should be made to counteract it by offering variety.

[1] W. Gilman Thompson, M.D.: "Practical Dietetics," 1909. D. Appleton & Co., New York.

PNEUMONIA

Dr. Thompson [1]

Dietetic Treatment. The indications for treatment are to give a light diet, which will not excite the cough in swallowing, or increase dyspnœa by distention of the stomach, or augment the enfeeblement of the heart action by overtaxing the digestive powers. Vomiting should be especially guarded against, and if nausea exists, efforts should be made at once to control it. It is not necessary to keep the patient upon a rigid milk diet, but if milk is well borne, it is advisable to give nothing else while the acute symptoms last; otherwise, whey, meat juice, broths, and egg albumin may be allowed. Starchy and saccharine food must be withheld. Cold drinks are both acceptable and beneficial to the patient, and water plain or aërated, such as White Rock or soda water, may be drunk in considerable quantity. It is believed by some authorities that the activity of the kidneys may be thus promoted, and that the poison which occasions the constitutional symptoms of the disease may be better eliminated. There are cases, however, among persons with robust circulation, in which the onset is very sudden and violent. The pulse is full and bounding, and the heart is greatly overworked by the effort to propel a large volume of imperfectly aërated blood. In such instances the addition of large quantities of fluid to the circulation, besides what is actually required for nutrition, may have the effect of still further straining the heart.

It is stated that carbonated waters reduce the viscidity of the sputum, which is often very tenacious.

The diet should be kept fluid until defervescence has occurred, with a normal temperature and commencing disappearance of the exudation — in fact, it is well to prolong the fluid diet for three or four days after the temperature has become normal, in order to make sure that a relapse of the fever is not likely to follow. In those cases in which resolution is postponed, and the patient becomes more and

[1] W. Gilman Thompson, M.D.: "Practical Dietetics," 1909. D. Appleton & Co., New York.

more feeble ,although the temperature may be nearly or quite normal, it may be desirable to give a little properly prepared solid food somewhat earlier, and scraped beef, with toast, or a soft-cooked egg may be added to the milk diet.

During the entire period of convalescence the diet must be very nourishing and of easy digestion; milk may still be given, and after slowly returning to the regulation three meals a day (see Diet in Convalescence from Typhoid Fever), very feeble patients do well to take milk punch, or egg-nog, or a glass of wine and a biscuit three or four times a day in the intervals.

Alcohol. In alcoholic subjects who have been drinking up to the time of the onset of the disease it may be indispensable to continue the use of alcohol for the sudden withdrawal of its stimulating effect on the organism may give rise to rapid collapse. In aged and constitutionally weak persons it is also indicated, but the majority of patients if given abundant fresh air do better without it.

The custom now in vogue of prescribing other forms of cardiac stimulants, such as strychnine and vasodilators, like nitroglycerin, makes the employment of excessive doses of alcohol less imperative. It should always be remembered that it is undesirable to produce toxic symptoms of alcoholism in pneumonia, as well as in any other disease. So long as the pulse is slowed and its force strengthened, the use of alcohol may be regarded as beneficial; but if delirium is increased, and the odor of whiskey or brandy is strong in the breath an hour or two after it has been given, it is an indication that the patient is receiving more than is desirable, and the dosage should be reduced.

BRONCHO-PNEUMONIA

Dr. Thompson [1]

Dietetic Treatment. Broncho-pneumonia is always a very critical disease, and the utmost care is required in nursing

[1] W. Gilman Thompson, M.D.: "Practical Dietetics," 1909. D. Appleton & Co., New York.

and feeding. Stimulation may be required early in considerable quantity. Hot milk and vichy in the proportion of one part of vichy to two of milk for older children or half and half for young infants may have the effect of loosening the mucus and easing the cough. If there is any tendency to flatulency, aerated waters had better be avoided. When the disease occurs in children the diet should be adapted to foster the strength and tax the digestive organs as little as possible. At first food should be given every two hours, and predigested milk is usually all that is required. Later it may be alternated with or supplemented by egg albumin, expressed meat juice, plain beef or mutton broths, arrowroot, or other gruels.

MUMPS

Dr. Thompson [1]

For mumps no special diet is required, beyond the necessity of giving fluids or soft food while the swelling of the parotid glands and fever last. The suggestions for the dietetic treatment of tonsilitis apply to this disease. Anæmia is apt to be extreme during convalescence, and meat should therefore be plentifully supplied. Cod-liver oil is very appropriate in protracted convalescence.

WHOOPING COUGH

Dr. Thompson [1]

In whooping cough the paroxysms of coughing are so severe as to give rise to vomiting, and in bad cases they are excited by taking food which does not have an opportunity to become assimilated, and nutrition may suffer very seriously in consequence, adding to the general exhaustion which accompanies the disease. All food must be made easily assimilable. It is best to give food regularly in moderate quantity at each time, and it should be predigested if necessary. Pancreatinised milk, kumyss, the prepared amylaceous

[1] W. Gilman Thompson, M.D.: "Practical Dietetics," 1909. D. Appleton & Co., New York.

foods, cream toast, eggs, junket, chicken broth, malted farinaceous foods, custard, milk puddings, gruels thickened with meat extracts, and stimulants in the form of egg albumin in sherry, egg-nog or milk punch, are recommended for patients who vomit solid food. The worst cases require nutrient enemata, as exhaustion becomes critical.

DIET IN TUBERCULOSIS

While the proper diet is the primary factor in the treatment in tuberculosis, the influence of good hygienic conditions must also be emphasized. Plenty of fresh air is an essential. Whenever it is possible to live out of doors this should be encouraged. Suitable periods of rest, and when possible some light exercise should be prescribed. The main object in treatment is to build up in the body such strong defenses against the activity of the tubercle bacillus that its rapid growth is arrested, and its results minimized.

The purpose of the dietetic treatment is to supply such foods as will conserve body tissue and help to restore what has been lost through disease. Feeding must be carefully controlled since an overabundance of food may result in injury to the organs of digestion and assimilation. For this reason the so called "stuffing method," or hyperalimentation, has been largely abandoned in the treatment of tuberculosis. A moderate amount of food well digested and assimilated is conducive to better result than overfeeding. Since individuals in normal health differ as to their energy requirements according to their weight, age and activity, so the diet in tuberculosis must be regulated to meet the individual need. A man at active work may require from 3000 to 4000 calories per day, but at complete rest, even though under treatment for tuberculosis his energy requirement may be reduced to about 2500 calories. On the other hand, the sedentary man of the same weight, who required perhaps 2500 calories in normal health might need 3000 calories if he should undertake some light exercise in the course of his treatment for tuberculosis.

If a patient is underweight the fuel value of the diet ac-

cording to Bardswell and Chapman should be increased 30 per cent. over his normal requirement for his highest weight in health,[1] and this supply maintained until he gains a slight excess over his highest normal weight. At this point his diet may be reduced by 15 per cent. so long as it proves equal to the maintenance of the required weight. For example an active man with an energy requirement of 3000 calories per day would need, if tuberculous, additional fuel to the extent of 900 calories until the proper weight was attained, and then a reduction of 450 calories could be made, leaving a daily total of 3450 calories. The increase in fuel value may be met by fats, carbohydrates or protein, though the capacity for digesting any kind of food must be taken into consideration. Fats such as cream, butter, olive oil, codliver oil and bacon are all valuable sources of fuel, but in some individuals they are not well digested nor assimilated in large quantities, so a substitution of some carbohydrate in the form of bread stuffs or vegetables may give better results.

Since there is a rapid waste of tissue in tuberculosis, the diet must contain a rather high per cent. of protein. In the normal diet from 10 to 15 per cent. of fuel in the form of protein is considered liberal, but it is advisable in this disease to raise the protein calories about 30 per cent. and give from 15 to 20 per cent. of the fuel value of the diet in the form of protein, in order to afford the best conditions for building up the tissues and repairing the waste. With a total energy requirement of 3000 calories a liberal amount of protein is supplied by 80 to 120 grams per day. With a 30 per cent. increase this would be advanced to between 120 and 155 grams. Protein in very large amounts is inadvisable as it may be accompanied by putrefaction, gout or other nutritive disorders and so delay the process of repair. Milk and eggs are best adapted to this purpose, and they appear most often as the basis of a tuberculosis diet, but other forms of protein such as those in cereals and legumes may be substituted if they are found to be equally digestible.

1 Note Energy Requirement of the Body, page 60.

In planning a diet for tuberculosis there must be the same recognition of individual differences as in health. The age and sex of the patient, as well as the amount of exercise, must be taken into account. While the diet in general should be more or less concentrated, a patient who is doing moderate work, and is accustomed to considerable bulk can digest with ease what a patient of sedentary habits would find quite difficult to dispose of. The cost of food is another factor in the diet for tuberculosis since the high protein diet demanded may prove too expensive especially if largely in the form of milk, eggs and meat. Proteins from plant sources, such as cereals, legumes, nuts and cheese, may be used in so far as they do not interfere with digestion. Oleomargarine, suet and beef drippings may replace the more expensive fats, such as butter and olive oil when necessary for economy.

The appetite of the patient in tuberculosis is usually poor; hence the food, though simple in character, should be prepared with the utmost care, and served attractively. Three meals a day stimulate the appetite better than a larger number. However, if the patient is in such a weak state as to be able to take only small quantities at a time, six small meals may be given at regular intervals. Sometimes three meals with a small amount of food served at bed time will be found advisable.

MENU FOR FOOD SERVED IN VERY SMALL QUANTITIES

8 A. M. Milk, taken slowly; toast and butter or marmalade.
10 A. M. Milk, taken slowly, or egg nog.
1 P. M. Dinner, consisting of small portions of broth, meat or fish, potato or macaroni, custard dessert.
4 P. M. Milk, taken slowly, varied for flavor by addition of cream, coffee or cocoa.
7 P. M. Supper, consisting of small portions of broth, a chop or cold meat, bread and butter, cooked fruit.
6 P. M. Bed time. Milk, taken slowly.

In this way 2500 or more calories may be taken without overtaxing the digestive system, and an increase up to 3000 calories may be made by adding more fat in the form of

cream, butter, or olive oil served as French Dressing on lettuce, with the dinner.

SOME INEXPENSIVE MENUS FOR TUBERCULOSIS [1]

Breakfast	*Gms.*	*Dinner*	*Gms.*	*Supper*	*Gms.*
Prunes	75	Bouillon, wafers ..	120	Creamed beef	89
Quaker oats, cream	25	Baked halibut	122	Baked potato	80
Bacon	10	Mashed potatoes ..	160	Dutch cheese	39
Corn muffins	20	Stewed tomatoes .	150	Biscuit	43
Bread, butter		Lemon jelly, cream	95	Baked apples, cream	75
Coffee, cocoa, milk		Bread, butter		Bread, butter	
		Milk		Tea, cocoa	

Bread for day	....	80 gms.
Butter " "	....	32 "
Milk " "	....	1430 "
Cream " "	....	160 "
Cocoa " "	....	250 "
Sugar " "	....	78 "

Average per patient per day:

Protein	Fat	Carbohydrate	Calories
127	107	372	3041

Breakfast	*Gms.*	*Dinner*	*Gms.*	*Supper*	*Gms.*
Orange		Fricasseed chicken	200	Boston Baked beans, ketchup .	82
Pettijohns	24	Sliced Tomatoes .	98	Marmalade	15
Sausage	63	Mashed potatoes .	126	Chocolate cake ...	67
Corn bread	40	Boiled rice	37	Prunes	63
Bread, butter		Vanilla ice cream.	120	Bread, butter	
Coffee, cocoa		Bread, butter		Tea, cocoa, milk ..	
Milk, cream		Milk			

Bread for day	....	120 gms.
Butter " "	....	28 "
Milk " "	....	1549 "
Cream " "	....	155 "
Cocoa " "	....	180 "
Sugar " "	....	60 "

Average per patient per day:

Protein	Fat	Carbohydrate	Calories
145	123	419	3456

[1] Actually served at the Loomis Sanatorium — cf. King, "On the Construction of an Efficient and Economic Diet in Tuberculosis," *Medical Record*, Oct. 16, 1909.

CHAPTER XV

DIET IN DISORDERS OF NUTRITION

DIET IN DIABETES

Diabetes Mellitus is a condition of the body in which carbohydrates are not fully utilized and accumulate in the blood as sugar (glucose) until a certain concentration is reached, when the sugar is excreted in the urine. Diabetes is believed to be due to a deficiency in the internal secretion of the pancreas.

During the progress of the disease, the power to use carbohydrate decreases; there is likely to be also a loss in the ability to use protein and fat. The sugar in the blood may come from proteins as well as from carbohydrate. In severe cases proteins and fats give rise to acids which are responsible for the complication called acidosis or ketonuria, so common in diabetes. Ketonuria is believed to be a direct factor in causing coma.

It is essential that any line of treatment result in a sugar free urine. The acids disappear during the treatment now used, and so are treated incidentally.

It is found that acidosis is very apt to ensue if carbohydrate be suddenly withdrawn and fat substituted, consequently it is advantageous to use a preparatory period, which precedes the starvation treatment introduced by Dr. Allen, to whom we owe much of the knowledge of the best way to treat diabetes mellitus.

DR. JOSLIN'S PREPARATORY TREATMENT

Withdraw fat from the diet. In two days withdraw protein. Two days later, halve the carbohydrate, and continue to halve the remainder each day until but 10 grams are given. Begin the fast.

THE FASTING PERIOD

This treatment is successful only when the urine becomes sugar free. Fast two to four days or longer, until the desired result is obtained. Give water, tea, coffee and broth freely during the fast. They prevent hunger and are stimulating. Alcohol is given 2 tablespoons in coffee every two hours, if the physician prescribes it. Two tablespoons of whiskey yield 105 calories, and is nutritious. Alcohol is not essential, however.

CARBOHYDRATE FEEDING

When feeding begins, it is important that there be no repetition of the same vegetable during a single day. Monotony in the diet of adults must be avoided if the best results are to be obtained. Green vegetables containing not over 5 per cent. carbohydrate prevent constipation. If given raw or steamed, no carbohydrate is lost and the valuable salts are conserved. If the patient cannot take even this small amount of carbohydrate, the vegetables may be made to lose much starch by boiling in three waters, throwing the first two away after the vegetable has cooked for a few minutes, and then cook at least fifteen minutes in all. These are "thrice cooked vegetables."[1]

A DIABETIC CHART

Dr. Elliott P. Joslin[2]

The intelligent management of a case of diabetes mellitus requires frequent comparisons between the diet, the urinary analyses and the weight of the patient. These data are often printed or written down in four or five different places, and the labor of uniting them is so great that it is seldom attempted. Any accurate study of a case is thus extremely difficult, and in hospitals past records are almost useless. To facilitate the treatment of diabetic patients and to eliminate some of the annoying sources of error, we have used a chart for some years upon which some of these facts were recorded.

1 Note page 262 for general directions in cooking "thrice cooked vegetables."
2 Dr. Elliott P. Joslin. "The Treatment of Diabetes Mellitus," Lea & Febiger, Philadelphia, Pa., 1916.

OUTLINE OF CHART[1]

Dr. Elliott P. Joslin

No. Name (Left-Half of Table). Present Address

Permanent Address Weight in Kilograms

Date	Vol. c.c.	Sp. Gr.	Reac.	Alb.	Acetone	Di-acetic Acid	B-oxy bu'ric Acid	Nitrogen G.	Ammonia Total G.	SUGAR IN URINE		
										Reduction %	Rotation %	Total G.

(Right-Half of Table).

DIET IN GRAMS						Carbohydrate Balance G.	$NaHCO_3$ G.	Naked Weight of Patient Lbs.	Pulse	Blood Sugar %	Alveolar air CO_2 %	REMARKS
Carbohydrate	Protein	Nitrogen	Fat	Alcohol	Calories							

(Opposite Side of Chart).

DIET	DATE	ORDERS	BREAKFAST	FORENOON	DINNER	AFTERNOON	SUPPER	NIGHT
STRICT DIET. Meat, Fish, Broths, Gelatine, Eggs, Butter, Olive Oil, Coffee, Tea and Cracked Cocoa.								

1 These charts may be purchased from Thomas Groom & Co., Boston, Mass.

Our chart was designed chiefly for the benefit of the physician, in contrast to the charts in use in various German clinics, which have a broader application and are of direct help not only to the physician, but also to the nurse and the patient as well. By this latter arrangement the chart becomes the nurse's record, and upon it the nurse writes what the patient actually eats. We have attempted to combine the two methods on the following chart, and hope that it will be found helpful and suggestive in the treatment of diabetic patients.

Space is reserved upon the chart for the Doctor's orders and the nurse's record, as well as the urinary analyses. There is given, in addition, a statement of the foods commonly allowed in a strict diabetic diet, with the percent of carbohydrates in other foods which are occasionally employed.

SUGGESTED DIET FOR DIABETES UNDER FASTING TREATMENT

Observation Diet.— The severity of diabetes is determined by an observation diet for forty-eight hours.

Fast Until Sugar-Free.— The patient is placed in bed (if necessary) and made to fast until sugar free. No food is given with the exception of coffee, tea or broth and whiskey if necessary, quantity depending upon the physician's judgment.

Carbohydrate Test.— Start with 10 grams of carbohydrates in green 5 per cent. vegetables, increase 10 grams daily until sugar appears in urine. Vegetables are given as salads raw or steamed.

First Day — 10 grams carbohydrates. Total calories, 65.

	Grams	Protein	Fat	Carbohydrate
Asparagus	200	3.0	.2	5.6
Lettuce	50	.7	.2	1.7
Celery	90	1.2	.1	2.7
Grams	340	4.9	.5	10.0
Calories		20.	4.	41.
Total Calories 65				

Fast Until Sugar-Free.— Follow directions as given above.

Mixed Diet. The diet is gradually built up with protein, fat and carbohydrates, keeping the patient sugar free, give tea, coffee or broth; thrice cooked [1] vegetables and bran biscuit [2] to give the necessary bulk.

Vegetables are used raw, steamed or thrice cooked (cooking at least 15 minutes and pour off all the water).

First Day — Protein 35, Fat 29, Carbohydrate 10, Total Calories, 450.

	Total Grams	Protein	Fat	Carbohydrate
Breakfast — Egg 1	150	22.3	15.9	
Asparagus (canned) 100 gms.	100	1.5	.1	2.8
Bran Biscuits 2 (6) (15 gms. Bran)	15		12.3	
Coffee 1 cup				
Dinner — Lean Beef 46 gms. .	46	9.5		
Butter 5				
Lettuce 50	100	1.3	.4	3.3
Celery 65				1.9
Cauliflower T. C.[3] 100 gms.				
Bran Biscuits 2				
Clear soup 1 cup				
Coffee 1 cup				
Supper — Eggs 2				
Butter				
Spinach T. C. 100 gms. ...				
Lettuce 50 gms.	50	.4	.2	2.0
Raw Tomato 50 gms.				
Bran Biscuits 2				
Clear Soup 1 cup				
Total grams		35.0	28.9	10.0
Calories		143	268	41
Total Calories 452				

The Fast Day. Regularly one day a week the patient has a fast day, taking tea, coffee and broth only.

1 See page 262 for general directions in cooking "thrice cooked vegetables."
2 Note Dr. F. M. Allen's recipe for bran biscuit, page 253.
3 T. C. (Thrice Cooked).

SUGGESTED CARBOHYDRATE TEST MENUS [1]

First Day

Order: 10 Grams of Carbohydrates, 60 Calories

				Calories
Breakfast.	Asparagus	100 grams	(2 heaping tbsp.)	16
	Coffee	236 c.c.	(1 cup)	
Dinner.	Lettuce	25 grams	(2 to 3 medium leaves)	5.3
	Celery	45 grams	(3 pieces 2¼ in. long)	8.4
	Asparagus	100 grams	(2 heaping tbsp.)	16
	Broth	236 c.c.	(1 cup)	
Supper.	Lettuce	25 grams	(2 to 3 medium leaves)	5.3
	Celery	45 grams	(3 pieces 2¼ in. long)	8.4
	Tea or Coffee	236 c.c.	(1 cup)	
	Total			60.4

Second Day

Order: 20 Grams Carbohydrates, Calories 125

Breakfast.	Asparagus	200 grams	(4 heaping tbsp.)	32
	Coffee	236 c.c.	(1 cup)	
Dinner.	Spinach	200 grams	(5 heaping tbsp.)	50
	Lettuce	50 grams	(5 or 6 med. leaves)	11
	Tomato	20 grams		5
Supper.	Lettuce	50 grams	(5 or 6 med. leaves)	11
	Celery	90 grams	(5 pieces 2½ in. long)	16
	Total			125

Third Day

Order: 30 Grams Carbohydrates, 193 Calories

Breakfast.	String beans	80 grams	(4 heaping tbsp.)	39
	Asparagus	200 grams	(4 heaping tbsp.)	31
	Tea or Coffee	236 c.c.	(1 cup)	
Dinner.	Cauliflower	100 grams	(2 heaping tbsp.)	38
	Spinach	150 grams	(¾ cup)	33
	Lemon jelly	121 grams	(¾ cup)	22
	Tea or Coffee	236 c.c.	(1 cup)	
Supper.	Cucumbers	50 grams	(6 slices)	8
	Celery	125 grams	(6 pcs. 6 in. long)	22
	Tea or Coffee or Broth	236 c.c.	(1 cup)	
	Total			193

[1] Note Table of Food Values According to Individual Servings, page 71-A.

Fourth Day

Order: 40 Grams Carbohydrates, 271.9 Calories

				Calories
Breakfast.	Brussels sprouts	70 grams	(2 heaping tbsp.)	24
	Celery	90 grams	(5½ pcs. 2¼ in. long)	16
	Grapefruit	¼		20
	Tea or Coffee	236 c.c.	(1 cup)	
Dinner.	Shredded cabbage	100 grams	(1½ cup)	30
	Eggplant	50 grams	(1 heaping tbsp.)	27.9
	Carrots	60 grams	(½ c. diced)	28
	Asparagus	200 grams	(4 heaping tbsp.)	31
	Tea or Coffee	236 c.c.	(1 cup)	
Supper.	Tomatoes (raw)	100 grams	(1 small 2 in. dia.)	22
	String beans	100 grams	(2 heaping tbsp.)	47
	Rhubarb	100 grams	(¾ c. cooked)	26
	Total			271.9

Fifth Day

Order: 50 Grams Carbohydrates, 294 Calories

Breakfast.	Orange			20
	Asparagus	200 grams	(6 med. stalks)	31
	Celery	100 grams	(6 pcs. 2¼ in. long)	18
	Tea or Coffee	236 c.c.	(1 cup)	
Dinner.	Onions, boiled	100 grams	(2 heaping tbsp.)	50
	Turnips	100 grams	(2 heaping tbsp.)	42
	String beans	100 grams	(2 heaping tbsp.)	50
	Broth	236 c.c.	(1 cup)	
Supper.	Spinach	150 grams	(3 heaping tbsp.)	38
	Carrots	100 grams	(2 heaping tbsp.)	45
	Tea or Coffee	236 c.c.	(1 cup)	
	Total			294

Sixth Day

Order: 60 Grams Carbohydrates, 369 Calories

Breakfast.	Grapefruit	½		40
	String beans	200 grams	(4 heaping tbsp.)	100
	Cauliflower	100 grams	(2 heaping tbsp.)	37.6
Dinner.	Onions	30 grams		15
	Squash	100 grams		51
	Beets	10 grams	(1 tbsp. diced)	4.5
	Kohlrabi	200 grams		61.8

			CALORIES
Supper.	Peas	50 grams	27.7
	Tomatoes	50 grams	11.2
	Lettuce	25 grams	5.5
	Celery	100 grams	18
	Total		369

SUGGESTED MIXED DIETS[1]

First Day

Order: Protein 35, Fat 29, Carbohydrate 10, Total Calories 450.

Breakfast.	Egg, 1	150 grams		75
	Asparagus (can)	100 grams	(2 heaping tbsp.)	15
	Butter	5 grams		33.4
	Bran biscuits (5 grams bran)	2		
	Coffee	236 c.c.	(1 cup)	
Dinner.	Lean beef	46 grams		175
	Butter	5 grams		33.4
	Lettuce	50 grams	(4 to 6 med. leaves)	10.6
	Celery	65 grams		12
	Cauliflower T. C.	100 grams	(2 heaping tbsp.)	38
	Bran biscuits	2		
	Clear soup	236 c.c.	(1 cup)	
	Coffee	236 c.c.	(1 cup)	
Supper.	Butter	5 grams		33.4
	Spinach T. C.	100 grams	(2 heaping tbsp.)	15.1
	Lettuce	50 grams	(4 to 6 med. leaves)	10.6
	Tomatoes (raw)	50 grams	(½ small 2 in. dia.)	11
	Bran biscuits	2		
	Clear soup	236 c.c.	(1 cup)	
	Total			450

Second Day

Order: 548 Calories.

Breakfast.	Grape fruit	¼		20
	Egg,	1		75
	String beans	50 grams	(1 heaping tbsp.)	25
	Asparagus	100 grams	(2 heaping tbsp.)	15
	Bran biscuits	2		
	Coffee	236 c.c.	(1 cup)	

[1] Note Table of Food Values According to Individual Servings, page 71-A.

				CALORIES
Dinner.	Codfish (fresh)	60 grams	(1 very small helping)	120
	Carrots	150 grams	(3 heaping tbsp.)	67
	Graham bread	16 grams	(1 slice)	50
	Wine jelly	113 grams	(¾ cup)	30
	Bran biscuits	2		
Supper.	Egg,	1		75
	Spinach	200 grams	(4 heaping tbsp.)	31
	Orange	1 small		40
	Bran biscuits	2		
	Total			548

THIRD DAY

Order: 769 Calories.

Breakfast.	Oatmeal	10 grams	(1 rounding tbsp. cooked)	40
	Milk	150 grams	(⅝ cup)	100
	Egg	1		75
	Bacon	14 grams	(4 small pieces)	100
	String beans	50 grams	(1 heaping tbsp.)	25
	Bran biscuits	2		
Dinner.	Beefsteak	60 grams		150
	Onions	150 grams	(3 onions size of egg)	75
	Carrots	50 grams	(1 heaping tbsp.)	22
	Coffee jelly	113 grams	(1 average helping)	22
	English walnuts	8		100
	Bran biscuits	2		
	Coffee	236 c.c.	(1 cup)	
Supper.	Grape fruit	½		40
	Celery	50 grams	(3 pcs. 2½ in long)	9
	Tomatoes	50 grams	(½ small, 2 in. dia.)	11
	Total			769

FOURTH DAY

Order: 926 Calories.

Breakfast.	Grape fruit	½ (small)		40
	Oatmeal	10 grams	(1 rounding tbsp. cooked)	40
	Milk	150 grams	(⅔ cup)	100
	Egg	1		75
	String beans	50 grams	(1 heaping tbsp.)	25
	Brussels sprouts	50 grams	(1 heaping tbsp.)	10
	Cream 20%	30 grams	(2 tbsp.)	60
	Bran biscuits	2		

				CALORIES
Dinner.	Hamburger steak	90 grams		225
	Lettuce	10 grams	(1 medium sized leaf)	2
	Cucumbers	30 grams	(4 slices)	5
	Turnips	150 grams	(3 heaping tbsp.)	61
	Rhubarb jelly and cream	120 grams	(½ cup)	25
	Bran biscuits	2		
Supper.	Eggs	2		150
	Oysters	6		50
	Cream 20%	15 grams	(1 tbsp.)	30
	Asparagus	100 grams	(2 heaping tbsp.)	15.4
	Celery	75 grams	(4½ pcs. 2½ in long)	13
	Bran biscuits	2		
	Total			926

FIFTH DAY

Order: 1276 Calories.

Breakfast.	Grapefruit	½		40
	Egg	1		75
	Bacon	30 grams	(8 small slices)	200
	Bran biscuits	2		
	Toast	1 slice		50
	Coffee	236 c.c.	(1 cup)	
Dinner.	Salmon	100 grams		200
	Squash	100 grams	(2 heaping tbsp.)	51
	Tomatoes cooked	100 grams	(2½ heaping tbsp.)	23
	Watercress and cottage salad [1]	100 grams	(2½ heaping tbsp.)	250
	Coffee jelly	113 grams	(1 average helping)	22
	Bran biscuits	2		
	Tea or coffee	236 c.c.	(1 cup)	
Supper.	Boiled ham	50 grams		135
	Shredded cabbage	90 grams	(2 rounding tbsp.)	30
	Toast	30 grams	(2 slices)	100
	Butter	14 grams	(1 tbsp.)	100
	Tea or coffee or cracked cocoa	236 c.c.	(1 cup)	
	Total calories			1276

[1] Made from 5½ tsp. cottage cheese, 1 tbsp. oil, 1 tbsp. vinegar, 5 or 6 walnuts and cress.

Sixth Day

Order: 1524 Calories.

				Calories
Breakfast.	Gluten breakfast food	30 grams		150
	Milk	120 grams	(⅝ cup)	100
	Egg	1		75
	String beans	100 grams	(2 heaping tbsp.)	50
	Orange	½		20
	Bran biscuits	2		
Dinner.	Corn beef	120 grams		200
	Spinach	120 grams	(2½ heaping tbsp.)	33
	Potatoes	30 grams	(⅓ medium potato)	25
	Lettuce and cucumber salad, French dressing	155 grams		225
	Ice cream	60 grams		135
	Bran biscuits	2		
	Tea or coffee	236 c.c.	(1 cup)	
Supper.	Eggs, 2	2		150
	Stuffed tomatoes	120 grams		42
	Toast	2 slices		100
	Butter	15 grams		100
	Cheese	22 grams	(1⅛ cube)	100
	Strawberries	50 grams		
	Bran biscuits	2		19

Total calories 1524

A LOW PRICED DIETARY FOR A DIABETIC ALLOWED 50 GRAMS (200 CALORIES) OF CARBOHYDRATE PER DAY[1]

		Weight oz.	Protein Calories	Carbohydrate Calories	Total Calories
Breakfast					
Scrambled eggs	2 eggs	4.0	45	..	150
Bacon	8 small pieces	1.0			200
Soy bean muffins ...	2 muffins	2.1	50	29	167
Butter	2 tbsp.	1.0	2		200
Cream, thick	1⅓ tbsp.	0.9	2	3	100
			125	32	817
Dinner					
Hamburg Steak	2 balls	4.0	170	..	200
Lentil Puree	1 serving	..	30	68	175
Whole wheat bread .	1 slice	0.7	8	41	50
Butter	1 tbsp.	0.5	1	..	100
Cottage Cheese Salad	1 serving	3.9	82	19	250
Coffee	1 cup	..	..	..	...
			291	128	775
Supper					
Boiled Ham	2 slices	2.5	57	..	200
Deviled egg	1 egg & 1 tbsp. cream	2.3	25	..	100
Shredded cabbage ...	1½ cups	3.4	6	21	30
Lemon jelly	¾ cup	4.3	8	14	22
Brazil nuts	2 large nuts	0.5	10	4	100
Whipped Cream	4 tbsp.	1.8	5	6	200
			111	45	652
			527	205	2244

[1] Mary S. Rose, Ph.D., "Feeding the Family." The Macmillan Co., 1917.

FOODS ARRANGED IN ORDER OF THEIR CARBOHYDRATE CONTENT, FROM LOWEST TO HIGHEST [1]

VEGETABLES

The following table was given to me by Dr. F. M. Allen, The Hospital of the Rockefeller Institute for Medical Research. New York, 1917.

Edible Portion		Protein Per cent.	Fat Per cent.	Carbohydrate Per cent.
Cucumbers	Fresh	0.8	0.2	2.5
Asparagus	Canned	1.5	0.1	2.8
Celery	Fresh	1.4	0.1	3.0
Spinach	Fresh	2.1	0.5	3.1
Asparagus	Fresh	1.8	0.2	3.3
Lettuce	Fresh	1.3	0.4	3.3
Brussels Sprouts	Canned	1.5	0.1	3.4
Rhubarb	Fresh	0.6	0.7	3.6
Beans, string	Canned	1.1	0.1	3.9
Tomatoes	Fresh	0.8	0.4	3.9
Tomatoes	Canned	1.2	0.2	4.0
Brussels Sprouts	Fresh	4.7	1.1	4.3
Sauerkraut		1.5	0.8	4.4
Artichokes	Canned	0.8		5.0
Leeks		1.2	0.5	5.8
Eggplant	Fresh	1.2	0.3	5.1
Pumpkin	Fresh	1.0	0.1	5.2
Cucumber pickles		0.5	0.5	5.4
Kohl-rabi	Fresh	2.0	0.1	5.5
Cabbage	Fresh	2.1	0.4	5.8
Cauliflower	Fresh	1.6	0.8	6.0
Radishes	Fresh	1.4	0.1	6.6
Turnips	Fresh	1.4	0.2	8.7
Carrots	Fresh	1.1	0.4	9.2
Beans, string	Fresh	2.2	0.4	9.4
Beets	Fresh	1.6	0.1	9.6
Peas, Green	Canned	3.6	0.2	9.8
Onions	Fresh	1.7	0.4	9.9
Squash	Fresh	1.6	0.6	10.4
Lima beans	Canned	4.0	0.3	14.6
Corn, green	Fresh	2.8	1.1	14.1
Peas, green	Fresh	4.4	0.5	16.1
Parsnips	Fresh	1.7	0.6	16.1
Artichoke	Fresh	2.6	0.2	16.7
Potatoes	Fresh	2.1	0.1	18.0
Lima Beans	Fresh	7.1	0.7	22.0
Bread		9.5	1.2	52.8

[1] See table of Food Values According to Individual Servings, page 71-A.

MEATS IN ORDER OF THEIR CARBOHYDRATE CONTENT, FROM LOWEST TO HIGHEST

Edible Portion	Protein Per cent.	Fat Per cent.	Carbohydrate Per cent.
Bacon	10.0	67.2	
Bacon crisp	10.0		
Beef — Sirloin, very lean	20.5	6.4	
Beef — Round, " "	20.8	5.8	
Chicken	22.8	1.8	
Ham, very lean	20.2	20.8	
Pork — Tenderloin	19.5	14.4	
Pork — Loin	19.7	19.0	
Lamb	19.1	12.4	
Veal	21.0	3.6	
FRESH FISH			
Sea Bass	18.8	0.5	
Blue Fish	19.0	1.2	
Cod — fresh	15.8	0.4	
Flounder	13.9	0.6	
Halibut	18.3	5.2	
Salmon	20.6	12.8	
Shad Roe	20.9	3.8	2.6
Shad whole	18.6	9.5	

DAIRY PRODUCTS IN ORDER OF THEIR CARBOHYDRATE CONTENT, FROM LOWEST TO HIGHEST

Edible Portion	Protein Per cent.	Fat Per cent.	Carbohydrate Per cent.
Eggs — 1	7.5	5.3	
Eggs — 100 gms.	14.9	10.6	
Butter		82.4	
Whole Milk	3.3	4.0	5.0
Buttermilk	3.0	0.5	4.8
Whiting's Milk [1] (Sugar of Milk)	5.97	7.36	
Cream, Average	2.5	18.5	4.5
CHEESE			
Dutch	37.1	17.7	
Cheddar	28.2	32.0	
Cheshire	26.9	31.6	
Cream	25.9	31.7	

[1] D. Whiting & Sons, 570 Ruthford Ave., Boston, Mass.

Edible Portion	Protein Per cent.	Fat Per cent.	Carbohydrate Per cent.
American — pale	28.8	36.2	
American — red	29.6	38.3	
Limburger	23.0	29.4	0.4
Boudon	15.4	21.7	0.7
Swiss	27.6	34.9	1.3
Brie	15.9	21.0	1.4
Neufchatel	18.7	27.4	1.5
Roquefort	22.6	29.5	1.8

FRUITS IN ORDER OF THEIR CARBOHYDRATE CONTENT, FROM LOWEST TO HIGHEST

Edible Portion	Protein Per cent.	Fat Per cent.	Carbohydrate Per cent.
Grapefruit			5.0
Watermelon	0.3	0.1	6.5
Strawberries	1.0	0.1	6.8
Blackberries	0.9	0.2	7.5
Muskmelon	0.6		9.3
Peaches	0.7	0.1	9.4
Pineapple	0.4	0.3	9.7
Orange	0.8	0.6	9.7
Lemon Juice			9.8
Cranberries	0.5	0.7	10.1
Raspberries	1.0		12.6
Grapes	1.0	1.3	13.3
Apricots	1.1		13.4
Pears	0.6	0.8	14.2
Apples	0.5	0.5	16.6

FOODS ARRANGED APPROXIMATELY TO PERCENTAGE OF CARBOHYDRATES [1]

Dr. Elliott P. Joslin

VEGETABLES (Fresh or canned)				
5% *		10% ± *	15% ±	20% ±
Lettuce	Tomatoes	Onions	Green peas	Potatoes
Cucumbers	Brussels	Squash	Artichokes	Shell beans
Spinach	sprouts	Turnip	Parsnips	Baked beans
Asparagus	Water cress	Carrots	Canned lima	Green corn

[1] Dr. Elliott P. Joslin, "The Treatment of Diabetes Mellitus," Lea & Febiger, Philadelphia, Pa. 1916.

[1] See table of "Food Values" according to "Individual Servings," page 71-A.

VEGETABLES (Fresh or canned)				
5% *		10% ± *	15% ±	20% ±
Rhubarb	Sea kale	Mushrooms	beans	Boiled rice
Endive	Okra	Beets		Boiled macaroni
Marrow	Cauliflower	Kohl-rabi		
Sorrel	Eggplant	Pumpkin		
Sauerkraut	Cabbage			
Beet greens	Radishes			
Dandelion	Leeks			
Swiss chard	String beans			
Celery	Broccoli			
FRUITS				
Ripe olives contain 20 per cent. fat		Lemons	Apples	Plums
Grapefruit		Oranges	Pears	Bananas
		Cranberries	Apricots	Prunes
		Strawberries	Blueberries	
		Blackberries	Cherries	
		Gooseberries	Currants	
		Peaches	Raspberries	
		Pineapple	Huckle-berries	
		Watermelon		
NUTS				
Butternuts		Brazil nuts	Almonds	Peanuts
Pignolias		Black walnuts	Walnuts (English)	
		Hickory	Beechnuts	40%
		Pecans	Pistachios	Chestnuts
		Filberts	Pine nuts	
MISCELLANEOUS				
Unsweetened and unspiced pickle		* Reckon available carbohydrates in vegetables of 5% group as 3%, of 10% group as 6%.		
Clams	Oysters			
Scallops	Liver			
Fish roe				

30 grams (1 oz.) contain approximately:	Protein, grams.	Fat, grams.	Carbo-hydrates, grams.	Calories.
Oatmeal, dry weight	5	2	20	120
Cream, 40 per cent.	1	12	1	120
Cream, 20 per cent.	1	6	1	60

30 grams (1 oz.) contain approximately:	Protein, grams.	Fat, grams.	Carbo-hydrates, grams.	Calories.
Milk	1	1	1.5	20
Brazil nuts	5	20	2	210
Oysters, six	6	1	4	50
Meat (uncooked, lean)	6	3	0	50
Meat (cooked, lean)	8	5	0	75
Bacon	5	15	0	155
Egg (one)	6	6	0	75
Vegetables 5 and 10% group	0.5	0	1 or 2	6 or 10
Potato	1	0	6	25
Bread	3	0	18	90
Butter	0	25	0	225
Fish, cod, haddock (cooked)	6.0	0	0	20
Broth	0.7	0	0	3
Small orange or ½ small grapefruit	0	0	10	40

1 gram protein,	4 calories.
1 gram carbohydrate,	4 "
1 gram fat,	9 "
1 gram alcohol,	7 "

6.25 grams protein contain 1 gram nitrogen.

1 kilogram = 2.2 pounds.

30 grams (gm.) or cubic centimeters (c.c.) = 1 ounce.

A patient at rest requires 25 calories per kilo body weight per 24°, approximately 1 calorie per kilo per hour.

Consult the Chemical Composition of American Food Materials, Bulletin No. 28, U. S. Dept. Agriculture, Office of Experiment Stations, send 10 cents in coin to Superintendent of Documents, Washington, D. C., also Annual Report of the Connecticut Agricultural Experiment Station, New Haven, Conn., Food Products and Drugs, 1913, Part I, Section 1.— Free.

TYPICAL MENUS USED IN DIABETES

PATIENT — AN ADULT [1]

First Day, 107 Calories

Orders: Orange, 1; grapefruit, ½; 5% vegetables, 150 grams — 107 total calories.

Breakfast.— Coffee, 150 grams; broth; orange, ½; asparagus, 50 grams.

[1] Dr. Elliott P. Joslin, "Treatment of Diabetes Mellitus." 1916.

Dinner.— Grapefruit, ¼; broth; tomatoes, 50 grams.
Afternoon.— Orange, ½.
Supper.— String beans, 50 grams; eggplant, 50 grams; tea; grapefruit, ¼.

SIXTH DAY, 299 Calories

Orders: 10% vegetables, 150 grams; orange, ½; 5% vegetables, 200 grams; grapefruit, ½; meat, 60 grams; eggs, 2 — 299.5 total calories.

Breakfast.— Grapefruit, ¼; egg, 1; string beans, 50 grams; asparagus, 50 grams; coffee.
Lunch.— Fish, 60 grams; carrots, 150 grams; orange, ½.
Afternoon.— Broth.
Supper.— Egg; cracked cocoa; spinach, 100 grams; grapefruit, ¼.

PATIENT — AGE 2 YEARS, 4 MONTHS [1]

(Dr. Joslin)

FIRST DAY, 49 Calories

Order: 5 per cent. vegetables, 100 grams, sugar free; milk, 30 grams — 49.3 total calories.

Breakfast.— Broth, 60 grams; string beans, 30 grams; sugar free milk, 10 grams.
Dinner.— Broth, 60 grams; cabbage, 40 grams; sugar free milk, 10 grams.
Supper.— Broth, 60 grams; asparagus, 30 grams; sugar free milk, 10 grams.

FIFTEENTH DAY, 310 Calories

Order: Oatmeal, 5 grams; 5 per cent. vegetable, 150 grams; 20 per cent. cream, 60 grams; meat, 15 grams; egg, 1 gram — 310 total calories.

Breakfast.— Broth with cream, 15 grams; oatmeal, 5 grams, with cream, 15 grams.
Dinner.— Meat, 15 grams; string beans, 50 grams; coffee jelly with cream, 15 grams.
Supper.— Egg, 1; celery, 50 grams; cream, 15 grams; broth; asparagus, 50 grams.

CARBOHYDRATE TEST DIET. TOTAL CALORIES 127

Hill and Eckman [2]

Breakfast.—

Asparagus (canned), 75 grams	(1¾ h. tbsp. chopped)	11.5
Cabbage, 65 grams	(1 very h. tbsp.)	23.
Tea or coffee		

[1] Dr. Elliott P. Joslin, "Treatment of Diabetes Mellitus." Diet actually used.
[2] "Starvation Treatment of Diabetes," Hill & Eckman. W. M. Leonard. Boston, Mass., 1916.

Dinner.—

Onions, cooked, 100 grams	(2 h. tbsp.)	50.
Celery, 50 grams	(3 pieces about 4½ in. long)	9.
Tea or coffee		

Supper.—

Spinach, 100 grams	(2 h. tbsp.)	25.
Celery, 50 grams	(3 pieces 4½ in. long)	9.
Tea or coffee		——
	Total	127.5

Protein, 7 grams; fat, 6 grams; carbohydrate, 15 grams; total calories, 150.

MIXED DIET. TOTAL CALORIES 379

Hill and Eckman [1]

Breakfast.—

String beans, 100 grams	(2 h. tbsp.)	50
Egg, 1		75
Coffee		

Dinner.—

Egg, 1		75
Turnips, 100 grams	(2 h. tbsp.)	42
Cabbage, 100 grams	(2 h. tbsp.)	35
Tea		

Supper.—

Egg, 1		75
Turnips, 100 grams	(2 h. tbsp.)	42
Spinach, 100 grams	(2 h. tbsp.)	35
Tea		——
	Total	379

Protein, 24 grams; fat, 22 grams; carbohydrate, 8 grams; total calories, 379.

MIXED DIET. TOTAL CALORIES 1143

Hill and Eckman [1]

Breakfast.—

Bacon, 50 grams	(2 slices about 6 in. long)
Asparagus, 100 grams	(2 h. tbsp. or 9 stalks 4 in. long (canned)
Spinach, 100 grams	(2 h. tbsp.)
Butter	
Cream	
Coffee	

[1] "Starvation Treatment of Diabetes," Hill & Eckman. W. M. Leonard, Boston, Mass., 1916.

Dinner.—

Steak, 100 grams	(1 small serving)
Turnips, 140 grams	(2 h. tbsp. +)
Spinach, 100 grams	(2 h. tbsp.)
Cabbage, 100 grams	(2 h. tbsp.)
Butter	
Tea	
Cream	

Supper.—

Spinach, 100 grams	(2 h. tbsp.)
String beans (cooked) 100 grams	(2 h. tbsp.)
Cauliflower (cooked) 120 grams	(2 h. tbsp. +)
Butter	
Tea	
Cream	

Allow during the day—

Butter, 20 grams
Cream, 2½ oz.

Protein, 35 grams; carbohydrate, 17 grams; fat, 100 grams; 1143 total calories.

CARBOHYDRATE FREE DIET, 500 CALORIES

Dr. Mosenthal [1]

		Calories
Breakfast.—	Egg, 1	83
	Bacon,[2] 50 grams	88
	Black coffee	
Dinner.—	Broth, 150 c.c.	16
	Steak, 40 grams	77
	5% vegetable (thrice cooked), 200 grams	33
	Butter, 5 grams	40
	Black coffee	
Supper.—	Broth, 150 c.c.	16
	Steak, 40 grams	77
	5% vegetables, 200 grams	33
	Butter, 5 grams	40
	Tea	
	Total	503

[1] "The Treatment of Diabetes Mellitus," Dr. H. O. Mosenthal, Baltimore Md.
[2] The bacon is weighed uncooked.

CARBOHYDRATE FREE DIET, 1000 CALORIES

Dr. Mosenthal[1]

Breakfast.—	Eggs, 2	166
	Bacon, 50 grams	111
	Butter, 5 grams	40
	Black coffee	
Dinner.—	Broth, 150 grams	16
	Steak, 100 grams	193
	5% vegetable (thrice cooked), 200 grams	33
	Olive oil, 10 grams	93
	Butter, 10 grams	80
	Black coffee	
Supper.—	Broth, 150 grams	16
	Steak, 75 grams	145
	5% vegetable (thrice cooked), 200 grams	33
	Butter, 10 grams	80
	Tea, plain	
	Total	1006

LITHEMIA OR EXCESS OF URIC ACID

Treatment for Uric Acid. Exercise in the open air — walk — plenty of fresh air by night as well as by day. Breathe deeply. Bathe often; rub the body thoroughly afterward; the skin should play an important part in elimination of uric acid.

To prevent the formation of an over supply of uric acid, be careful of diet. The first thing, do not eat meat. You may eat nuts with salt, fresh ripe fruit; best of all, apples unpeeled; all cooked fruits, but very little sugar in them; all vegetables that grow above ground (not those that grow below ground); greens are especially good, with good cider vinegar. Bread may be eaten in moderation, graham and entire wheat best, good water crackers, cereals of all kinds; eggs should be used sparingly, and in severe cases not at all. Fish is good, also shellfish. No pastry or sweet cake; milk and cheese may be used freely, also buttermilk. Drink no coffee, tea, malt or alcoholic liquors. Drink pure water and a great deal of it; sometimes it is well to use lithia tablets.

[1] "The Treatment of Diabetes Mellitus," Dr. H. O. Mosenthal, Baltimore, Md.

DIET FOR URIC ACID GRAVEL AND ACUTE NEPHRITIS

Massachusetts General Hospital [1]

8 A. M.— Wheat cereal with cream and sugar.
Bread and butter.
11 A. M.— Milk — 1 glass with 1 ounce of cream and four crackers.
1 P. M.— Rice or tapioca with cream and sugar.
Toast and butter.
Ice cream and custard.
4 P. M.— Milk and cream and crackers.
6 P. M.— Cereal and cream.
Toast.
Mashed potato.
Apple sauce.

Later, add eggs and green vegetables. No meat or meat soup.

DIET IN GOUT

Mary Swartz Rose, Ph.D. [2]

Gout is a disease of the overfed rather than the undernourished. Luxurious living, with its constant temptation to overeat, especially of protein foods, and to avoid exercise, often brings its penalty in the form of acute or chronic gout. Indulgence in alcoholic beverages, especially as an accompaniment to a sumptuous repast, increases a man's chances of acquiring the disease. Sometimes he suffers for the sins of his ancestors, the tendency to the disease being said to be transmissible. There are usually disturbances of the digestive system — gastric indigestion, intestinal putrefaction, and constipation — but the most constant symptom is an excess of uric acid in the blood, indicating a faulty elimination of this substance. Uric acid is formed in the body, but in health it is excreted in the urine, so that the amount in circulation in the blood is very small. In gout this acid accumulates in the blood and is eliminated with difficulty. The following are to be avoided: (1) all foods which disturb digestion; (2) all foods which tend to induce intestinal putrefaction and constipation; (3) all excess of total fuel and of protein food; and (4) all foods which by their composition

[1] Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.
[2] Mary Swartz Rose, Ph.D., "Feeding the Family." The Macmillan Co., New York, 1917.

tend to increase the amount of uric acid which the body has to get rid of. Uric acid belongs to a group of closely related substances called purins. These are found in flesh foods of all kinds and in some vegetable foods. The purins other than uric acid in these foods are mostly converted into uric acid in the body. Hence, if elimination is faulty, they raise the amount of uric acid in the blood, a condition considered very unfavorable in cases of gout, though the relation of this substance to the disease is not fully understood. The taking of alcoholic beverages also tends to hinder uric acid elimination, and these should be excluded in gout.

The treatment is largely dietetic and the diet should be adapted to the needs of the patient by the physician. Some information, however, as to the purin content of foods will be helpful in carrying out his orders. Milk, eggs, cheese, nuts, gelatin, fruits, sugars, breadstuffs made with white flour, cornstarch, tapioca farina, rice, potatoes and other root vegetables, most green vegetables (spinach and asparagus excepted), and all kinds of fat are practically purin-free.

Sweetbreads, kidney, liver, sardines, and anchovies are very rich in purins and should be entirely avoided. Beef, veal, mutton, pork, chicken, turkey, goose and other kinds of game, fish with the exception of cod are fairly high in purin content, and should be sparingly if at all indulged in. Boiling meat will remove some of the purins; hence boiled meats are sometimes allowed where roasted or broiled ones are not. Among vegetable foods, spinach, asparagus, peas, and beans are richest in purins, though none of these contains as much as meat. A dietary indicating the type of food best adapted to use in gout is given on the following page.

A DAY'S DIETARY SUGGESTED FOR CHRONIC GOUT (ROSE) [1]

	Measure	Weight Oz.	Protein Calories	Total Calories
7 A. M.:				
Hot water	1 cup	—	—	—
8 A. M.:				
Orange	1 large	9.5	7	100
Rice	⅜ cup	2.0	5	50
Cream, thick	1 tbsp. (scant)	0.5	1	50
Sugar	1 tbsp. (scant)	0.5	—	50
Hot milk	1¼ cups	10.2	38	200
Bread	4 slices	1.3	28	200
Butter	1 tbsp.	0.5	1	100
Peaches	1½ medium	5.3	3	50
				800
1 P. M.:				
Soft-cooked eggs .	2 eggs	3.4	54	150
Baked potato ...	2 medium	6.0	22	200
Celery		4.8	6	25
Bread	4 slices	2.6	28	200
Butter	1 tbsp.	0.5	1	100
Peaches	1½ medium	5.3	3	50
Tea, very weak and unsweetened ...	—	—	—	—
				725
6 P. M.:				
Milk	1¼ cups	10.2	38	200
Bread	6 slices	3.9	42	300
Baked apple with whipped cream	1 small apple	2.4	1	100
Sugar	1 tbsp. (scant)	0.5	—	50
Butter	1 tbsp.	0.5	1	100
				750
Total for day .			279	2275

[1] Mary Swartz Rose, Ph.D., "Feeding the Family." The Macmillan Co., New York, 1917.

ACUTE RHEUMATISM

Thompson [1]

Dietetic Treatment. While the fever lasts and other symptoms are acute, such as pain and swelling of the joints, the patient should be put upon a fluid diet. The majority of cases do best at this time with an exclusive milk or bread-and-milk diet. Those patients who cannot take milk, however, may be allowed soups and broths flavored with vegetable extracts, chicken tea, milk toast, barley or oatmeal gruel, clam broth.

Thirst is often a prominent symptom, especially if there be much fever, and it is advisable for the patient to drink fluid freely to assist in washing out the waste products from the body. Lemonade and slightly acid drinks of various kinds, such as dilute phosphoric acid or the effervescent mineral waters, are recommended. Boiled milk and Seltzer or Vichy may be drunk, or oatmeal or barley water flavored with lemon. Alcohol should be avoided while the acute symptoms last, unless the complication of inflammation of the endocardium or pericardium enfeeble the heart action, if prolonged and anæmia is considerable, alcohol may be given as a tonic two or three times a day in the form of a glass of claret or Burgundy (one to two ounces), or diluted whiskey.

During convalescence the appetite is not usually vigorous, and it is not necessary to urge the taking of much food at first. The diet should be principally farinaceous, but not saccharine.

Such articles may be given as rice (plain or spiced), arrowroot, oatmeal, cornmeal, semolina, wheaten grits, panada, milk toast, simple unsweetened puddings, wine jelly, blancmange and malted foods.

The return to solid diet should be gradual, and for a long time the patient should abstain from eating meats as well as from pastry and sweets. Fagge states that no meat or fish should be allowed for at least a week after subsidence of the

1 W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

fever and acute symptoms, or, better, for a fortnight, and many believe that beef tea is harmful. Meat can undoubtedly induce a relapse.

When convalescence becomes established, eggs, fish, oysters, and white meat of broiled or roasted chickens may be given, and one or two such vegetables as asparagus, spinach, or stewed celery, with a baked apple or fresh fruit, but sweets and alcohol should long be withheld.

The patient should be fed often, having one or two extra lunches during the day, for anæmia is apt to prevail for some time, and abundant nutriment is required.

CHRONIC RHEUMATISM

DIET: *Soup.*— Beef tea, chicken and mutton broth in small quantities.

Fish.— Raw oysters or clams, white fleshed fresh fish — broiled or boiled.

Meat.— Sweetbreads, chicken, tripe, broiled fat bacon or boiled ham (all sparingly).

Farinaceous.— Boston brown bread, corn, whole wheat bread, cornstarch, rice, milk toast, dry toast, graham bread, granum, butter. crackers.

Vegetables.— All except potatoes and cooked tomatoes.

Desserts.— Plain puddings, rhubarb; junket (all without sugar).

Liquids.— Milk, cream, buttermilk, malted milk, alkaline waters, tea, cocoa (no sugar), pure water, plain or with lemon or lime (no sugar).

AVOID.— Red meats, pork, turkey, goose, duck, veal, fried fish, cooked oysters or clams, salted, dried, potted or preserved fish or meats (except ham and bacon). Lobsters, crabs, salmon, eggs, rich pies, made dishes, gravies, potatoes, tomatoes, asparagus, mushrooms, rich puddings, candies, nuts, cheese, coffee, cider, malt liquors, wines.

DIET FOR OXALURIA

Massachusetts General Hospital [1]

Avoid spinach, rhubarb, cocoa, chocolate, tea, coffee, green peas, potatoes, tomatoes, berries, plums, figs.

Reduce the carbohydrate foods in diet — as sugar, puddings, sweets, cake.

Breakfast.— Eggs, toast, milk.

[1] Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.

Dinner.— Meat, fish, green vegetables (except those forbidden), onions, carrots, squash, beets. Custard, ice cream.
Supper.— Cold meat, cereal bread, cooked fruit.

DIET IN OBESITY

This is one of the most important features of dietetic therapy, and is older and better known than any other, probably because of its connection with conditioning athletes for all kinds of contests and also from the cosmetic point of view, as superfluous flesh generally implies advanced years. Unlike many other plans of diet it concerns the nominally healthy rather than the sick and invalid.

The old trainer of athletes knew little or nothing of any scientific regimen for reducing adipose tissue. For him reduction of weight was merely a matter of getting rid of superfluous water, to be accomplished by sweating, purgation and abstinence from fluids. He rejected certain articles of diet as "bad for the wind," but this is as near as he came to specializing in diet. Exercise, without profuse perspiration, meant nothing to him. The steady grind of a worker who burns up so much excess fat daily, yet without any unusual degree of perspiration, is something he took no account of.

Of recent years it has been learned that abstinence, hot baths and purgation, are far less efficacious in keeping down weight than continuous and vigorous exercise within the fatigue limit. It is much less a matter of starvation and elimination than of a steady oxidation of superfluous tissue by graded and varied exercises extending throughout the day. But while constant exercise is the chief essential, it is also important to curb the appetite for food and drink, and to keep the excretory organs active. Otherwise, in the case of novices at least, increased exercise will provoke increased appetite for food and drink, so that not a few people gain flesh while trying to lose it.

Doubtless the best plan for reducing flesh without suffering and violence is to do a great amount of work daily, severe enough in character to oxidize much body fat, but without

profuse waste of fluids by sweating, etc. In regard to the meals, these should be small, light and as frequent as desired. Nothing should be taken to provoke thirst. Any food-article whatever which is especially rich in starch, sugar or fat, along with alcoholics, must be omitted. Such individuals thrive best on toast or biscuit without butter; lean meats, fish and eggs; and vegetables which grow above ground.

The selection of food differs but little from the diabetic regimen, but some carbohydrates are allowed, while the fatty articles, including milk, permissible in diabetes, are to be avoided. The patient is not to be stinted in quantity provided he takes the necessary amount of exercise. He may breakfast freely on eggs, meat and toast, dine on meats and salad vegetables, etc. He should take as little fluid as possible with his meals, but may quench his thirst between meals. By masticating his food thoroughly he materially reduces the demand, and does away with eating for the mere sake of eating.

By simple measures of this sort an individual may reduce his weight to as great degree as desirable, and the process will not be painful, but the reverse. He simply oxidizes and otherwise utilizes a little more matter than he takes in, and thereby prevents a pathological and unsafe accumulation of fat.

DIET FOR REDUCTION OF OBESITY

Massachusetts General Hospital[1]

MENU

Breakfast.— Cup black coffee (with milk but no cream or sugar). raw fruit (1 orange, apple, pear, or ½ grapefruit), eggs (one or two, boiled or poached), toast (one or two small slices, *i.e.*, 10–20 grams, usually without butter).

11.30 A. M.— Cup bouillon (250 c.c.), skimmed milk or buttermilk, or fruit.

Luncheon.— Clear soup, 120 c.c., moderately lean meat or fish, 100 grams (or eggs), two varieties green vegetables, 50–100 grams each, as spinach, or lettuce, or cabbage or cauliflower, or onions or lentils, or beets, or carrots, or string beans, or celery, or squash.

[1] Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.

5 P. M.— Raw oysters, moderately lean meat or fish, 100–150 grams, two varieties green vegetables, 50–100 grams each (as in luncheon), salad (fruit or vegetable) with small quantity of French dressing), raw or unsweetened cooked fruit, orange, grapefruit, apple, pear, grapes, demi-tasse black coffee.

The above menu represents, according to choice, a maximum and minimum value, as follows:

	Protein	Fat	Carbohydrates	Calories
Minimum	60	50	70	1000
Maximum	100	70	165	1738

DIET: *Meat and Fish.*— All lean meats and fish, except as noted below, but without rich dressing or sauce.

Soups.— Thin soups in moderation.

Eggs in any form except scrambled, fried and omelette.

Fruits.— All fresh varieties (except bananas), and berries (without cream and sugar); cooked, if with saccharin.

Vegetables.— String beans, water cress, lettuce, radish, cucumber, asparagus, green peas, Brussels sprouts, cabbage, cauliflower, okra, onions, celery, watermelon, tomato, artichoke, spinach, white potato in moderation, mushrooms, squash, beets, turnips, carrots, parsnips, oyster plant.

Miscellaneous.— Tea, coffee, skimmed milk, lemonade (with saccharin), ginger ale. Desserts made of gelatin, or Irish moss, if with but little sugar; use saccharin or sweetena in place of sugar.

AVOID (or to be avoided or greatly restricted):

Starches.— Bread, crackers, cereals, macaroni, vermicelli, spaghetti, sago, tapioca, corn, cornstarch, sweet potatoes, shelled beans, dried peas or beans and nuts.

Sweets.— Sugar, candy, dried fruits, syrups, fruit preserves, honey, marmalade and sugar sauces.

Meats.—Pork, bacon, goose, sausage, croquettes.

Fish.— Shad, fresh salmon, eels, sardines, mackerel, bluefish, fried fishes.

Fats.— Butter, cream, olive oil, bacon, lard; fat meats and fishes.

Desserts.— Ices, rich puddings, cake and gingerbread.

CHAPTER XVI

DIET IN DISEASES OF THE STOMACH

ACUTE GASTRITIS

Einhorn [1]

During the first or second day of illness it is best not to give the patient anything substantial to eat. Strained barley or rice water, or weak tea may be taken. On the third day, as soon as the appetite reappears, the patient is permitted to partake of water soup (bread and hot water) oatmeal or barley gruel, rice soup, and perhaps one soft-cooked egg. Later on French bread, butter and oysters may be added to the dietary.

If the improvement is steadily progressing the fourth day begin with meat once a day, and thus slowly return to the usual bill of fare.

CHRONIC GASTRITIS

Einhorn [1]

The regulation of the diet is of prime importance in the treatment. The dietary to be selected will depend on the severity of the symptoms.

At the beginning, therefore, a light diet will be called for. The patient should partake of four meals daily. The articles of food should be given largely in liquid and semi-liquid forms; that is, milk, kumyss, matzoon, barley, oatmeal, and rice soup prepared in milk; chicken soup with an egg beaten up in it; soft-cooked eggs, mashed potatoes, scraped meat, raw, or boiled, toasted bread, and also French white bread (not too fresh); butter; tea and cocoa.

[1] Max Einhorn, M.D.: "Disease of the Stomach." New York. William Wood & Co.

The quantity of nourishment for each meal should neither be excessively large nor too small.

My own bill of fare for the first week of the treatment is as follows:

	Calories.
Eight o'clock:	
Two eggs	160
Two ounces of French white bread	156
One-half ounce of butter	107
One cup of tea (100 gm. of tea, .150 gm. milk)	101
Sugar 10 gm. (ʒ iiss.)	40
Half past ten o'clock:	
Kumyss or matzoon or milk, 250 gm. (℥ viii. ⅓)	168
Crackers, 30 gm. (one ounce)	107
Butter, 20 gm. (ʒ v.)	163
Half past twelve o'clock:	
Two ounces of tenderloin steak, or of white meat of chicken	76
Mashed potatoes, or thick rice, 100 gm. (℥ iii. ⅓)	127
White bread, two ounces	153
Butter, one-half ounce	107
One cup of cocoa, 200 gm. (℥ vi. ⅔)	101
Half past three o'clock:	
The same as half past ten	438
Half past six o'clock:	
Farina, hominy, or rice boiled in milk, one plateful, 250 gm. (℥ viii. ⅓)	440
Two scrambled eggs	160
Bread, two ounces	156
Butter, one-half ounce	107
	2.863

The patient having been kept on this diet for a week or two, the diet must be gradually changed to one suitable for the lighter forms of chronic gastritis. Here the following rule will apply: The diet should correspond as nearly as possible to the common mode of living. In this way the distribution of the meals should be arranged according to the customs prevailing in those places in which the patient lives.

All food derived from the vegetable kingdom should be given in large portions, while the quantity of meat should be somewhat limited.

In order to permit the patient to have a greater variety in his food, it is best not to point out a few articles he should eat, but to mention only those he should avoid. Forbid meat with very tough fibers, meat from too old animals or too fresh meat (right after slaughtering), meat that contains too much fat, like pork; forbid sausages, lobster, salmon, chicken salad, mayonnaise, cucumbers, pickles, cabbage, strong alcoholic drinks like liquors.

It must be impressed upon the patient to masticate the food thoroughly, to eat slowly, not to think of business during meals, and to stop eating before the sensation of satiety appears. The latter advice is only necessary in persons who are accustomed to high living.

* * * * * * * *

Chronic gastric catarrh is frequently combined with constipation. The diet can be arranged as to facilitate movement of the bowels. All foods which contain a large percentage of cellulose (undigested matter) increase the quantity of feces, thereby effecting a stronger peristalsis of the larger bowel.

All kind of green vegetables (spinach, asparagus, green peas) and rye bread are therefore very suitable. Many organic acids possess the property of increasing intestinal peristalsis. Almost all kinds of fruits contain a certain quantity of these organic acids, and act like mild aperients. The use of cooked pears, stewed or baked apples, stewed prunes, is in many instances effective. Ewald recommends a mixture of two parts of prunes to one part of dried figs. The taste is agreeable, and the cathartic action mild. The custom of eating an orange in the morning for its laxative effect is well known. To these dietary remedies we may also add the use of a glassful of either very cold or warm water, or a glass of milk in arising, in the fasting condition.

There are many persons in whom one of these latter means produces a good movement of the bowels.

DIET IN GASTRIC HYPERACIDITY

The dietetic treatment of gastric hyperacidity is very important because it virtually is equivalent to the preventive diet of gastric ulcer and to diet after recovery from the latter. It should be extremely simple and bland, consisting of but few dishes of easily digested solids, together with milk. Sweets cannot be used. Carbohydrates are obtained from bread and potatoes in relatively small amounts; while the protein content is relatively high because this combines with the acid of the gastric juice. Vegetables are limited to well cooked greens, green peas, etc. All bulky food which leaves residues and all irritant substances are naturally out of place in a bland diet.

OUTLINE OF DIET IN HYPERACIDITY

Dr. Max Einhorn [1]

			Calories.
7:30 A. M.	2 Eggs		160
	Wheaten bread	50 gms.	128
	Butter	20 gms.	163
	Milk	250 gms.	169
10:30 A. M.	Zoolak or Milk	200 gms.	135
	Crackers or Bread	30 gms.	77
	Butter	10 gms.	81
1 P. M.	Broiled Meat	100 gms.	210
	Mashed Potatoes	50 gms.	63
	Bread	30 gms.	77
	Butter	10 gms.	81
	Weak tea or Vichy Water	200 gms.	
3:30 P. M.	The same as at 10:30 A. M.		293
6:30 P. M.	Soup (with Barley or Vermicelli)	200 gms.	100
	Bread (30 gms.) and Butter	10 gms.	158
	Meat (broiled or boiled)	100 gms.	210
	Potatoes baked	50 gms.	60
	Green vegetables (Spinach, green peas)	50 gms.	80
	Coffee (half milk)	100 gms.	34
10 P. M.	Oysters and Crackers, or Cold Meat Sandwich; 1 glass Beer		260
	Total		2539

[1] Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School of Medicine. Physician to Post Graduate and German Hospital, 1917.

FOODS FROM WHICH THE DIET IN GASTRIC HYPERACIDITY MAY BE CHOSEN

Dr. Herbert S. Carter [1]

DIET: *Raw oysters:*

Soups.— Cream or purée (except tomato).

Fish.— Fresh cod, halibut, bass, boiled with cream sauce or broiled.

Meat.— Beef well done (without gristle, fat, or gravy), chicken, turkey, guinea hen, lamb (without fat), once daily.

Vegetables.— All soft-boiled green vegetables, except cabbage, cauliflower, brussels sprouts, or turnips. Baked white potato may be used moderately. Rice or macaroni.

Cheese.— Any mild variety, but better without this at first.

Desserts.— Cream and egg desserts of all sorts, *e. g.*, blanc-mange, Bavarian cream, floating island, cup custard, junket, soft rice or bread puddings. Gelatin desserts made with little flavoring. Very little sugar used in all desserts. Fruit, none, except when constipation is a marked feature, then stewed soft fruits may be taken in good amount, but must be cooked with very little sugar and are best taken with or after a meal, never before. Cream may usually be freely used.

Bread.— Toast, stale bread, roll. (Fresh butter or salt butter freshened by working it over in fresh water.)

Drinks.— Weak tea, cocoa, water, and milk.

Cereals.— Fine-grained varieties, well cooked.

Eggs.— In all forms except fried.

AVOID.— All sour, spiced, or peppery foods, condiments, salt foods, chow-chow, etc. Sweets, fried foods.

Very hot or very cold food or drinks.

Rough hard substances, such as seeds, skins of fruit or vegetables, corn, uncooked vegetables.

Coffee, wines, liquors, beer.

Hot breads, pies, cakes, syrups, etc.

ULCER OF THE STOMACH

Dr. Max Einhorn [1]

The diet consists of liquids — milk, milk with strained barley, or oatmeal, or rice water; plain water, weak tea and peptone (one teaspoon to a cup of water). Debove and Rémond have suggested the addition of lactose and of meat powder to the milk, in order to make the diet richer in nourishment substances.

[1] Dr. Herbert S. Carter, "Diet Lists of the Presbyterian Hospital," W. B. Saunders Co., Philadelphia, Pa., 1917.

[2] Max Einhorn, M.D.: "Diseases of the Stomach." New York. William Wood & Co.

As a rule, we employ the above-named additions, which fulfill the same purposes, besides varying the monotonous bill of fare.

First week. During the first week we give the patient half a cup (about 100–150 c.c.) of either, every hour. Everything the patient takes must be neither cold nor very warm, and should be taken slowly (sipping, or with a spoon).

Second week. During the second week we order the same kind of food, with this difference, that he is nourished every two hours, and gets a cupful or a cupful and a half (200 to 300 c.c.) at a time.

Occasionally we now allow the patient one raw egg beaten up in the milk, once or twice a day. In the beginning of the third week we feed the patient every three hours; he is allowed barley, farina, and rice (well cooked) in milk, soft-cooked eggs, crackers softened in milk, in addition to his previous foods; in the third day of the third week we begin to give the patient meat, first raw, well scraped, then broiled.

Thereafter we go over to the ordinary daily diet, excluding heavy salads, pastry, raw fruit and the like.

In the following table I give an outline of diet which I ordinarily prescribe in this affection:

OUTLINE OF DIET IN GASTRIC ULCER

Dr. Max Einhorn

First Three Days

		Number of Calories.
7 A. M.:	milk, 150 C.C. (five ounces)	101
8 "	milk, 150 C.C. (five ounces)	101
9 "	milk, 150 C.C. (five ounces)	101
10 "	milk and strained barley water (āā, 150 C.C.)	80
11 "	milk, 150 C.C.	101
12 "	milk, 150 C.C.	101
1 P. M.:	bouillon either alone or with the addition of one to two teaspoonfuls of a peptone preparation, 150 C.C.	30
2 "	milk	101
3 "	milk	101
4 "	milk	101

		Number of Calories.
5 P. M.:	milk with strained barley or oatmeal	80
6, 7, 8, 9, P. M.:	milk, 150 C.C.	404
		1402

FOURTH TO THE TENTH DAY

7 A. M.:	milk, 300 C.C. (ten ounces)	202
9 "	milk, 300 C. C. (ten ounces)	202
11 "	milk with barley, rice, or oatmeal water, 300 C.C.	160
1 P. M.:	one cup of bouillon, 200 C.C., and one egg beaten up in it	80
3 "	milk, 300 C.C.	202
5 "	milk, 300 C.C.	202
7 "	milk with barley water, 300 C.C.	160
9 "	milk, 300 C.C.	202
		1410

ELEVENTH TO THE FOURTEENTH DAY

7 A. M.:	milk, 300 C.C.	202
9 "	milk, 300 C.C.	202
	and two crackers softened (one ounce)	100
11 "	milk with barley water, 300 C.C.	160
1 P. M.:	one cup of bouillon, 200 C.C., one egg, and two crackers	180
3 "	milk, 300 C.C., and one egg	282
5 "	milk, 300 C.C.,	202
	and two crackers	100
7 "	milk, with barley water	160
9 "	milk, 300 C.C.	202
		1790

FOURTEENTH TO THE SEVENTEENTH DAY

7 A. M.:	milk, 300 C.C.	202
9 "	milk, 300 C.C.	202
	and two crackers (one ounce)	100
11 "	milk with barley, 300 C.C.	342
1 P. M.:	scraped meat, 50 gm.	60
	two crackers, one cup of bouillon, 200 C.C.	100
3 "	milk, 300 C.C.	202
5 "	milk, 300 C.C.	202
	one egg (soft boiled)	80
	two crackers	100

		Number of Calories.
7 P. M.:	milk with farina, 300 C.C.	342
9 "	milk, 300 C.C.	202
		2134

SEVENTEENTH TO TWENTY-FOURTH DAY

7 A. M.:	two eggs (soft boiled)	160
	butter, 10 gm.	81
	toasted bread, 50 gm.	130
	milk, 300 C.C.	202
10 "	milk, 300 C.C.	202
	crackers, 50 gm.	166
	butter, 20 gm.	162
1 P. M.:	lamb chops (broiled), 50 C.C.	60
	mashed potatoes, 50 gm.	44
	toasted bread, 50 gm.	130
	butter, 10 gm.; one cup of bouillon, 200 C.C.	81
4 "	the same as at 10 A. M.	530
6:30 "	milk with farina, 300 C.C.	342
	crackers, 50 gm.	166
	butter, 20 gm.	162
9 "	milk, 300 C.C.	202
		2820

In cases of ulcer of the stomach presenting a more severe type — violent pains, frequent vomiting, inability to take food on account of the pains — or after hæmatemesis, I usually have the patient abstain from any food whatever, given by the mouth, for a period of five days. The patient is then fed by the rectum. This is done in the following way: early each morning the patient receives a large enema of about a quart of lukewarm water, in which a teaspoonful of common tablesalt has been dissolved as a cleansing enema. About an hour after the patient has emptied the injected water the first nourishing enema is given; this may consist either of a glassful of milk (about 200 c.c.), in which a raw egg has been well beaten and a pinch of salt added, or of a cupful of water in which a tablespoon of a good peptone preparation has been dissolved. The temperature of either must be about 100° F. Such a nourishing enema is given

three or four times a day. The quantity of the feeding enema is 200–250 c.c., and it is slowly injected by means of a fountain syringe and a soft-rubber rectal tube. The patient may frequently wash his mouth with cold water, and is allowed from time to time to keep a small piece of chopped ice in his mouth, and to swallow the melted water. The five days being over, the mode of diet is the same as described above for the ordinary form of ulcer.

DIET FOR ACTIVE ULCER OF THE STOMACH OR DUODENUM

Massachusetts General Hospital [1]

For two days — 2 oz. milk with one powdered cracker (3½ in. square). Given every two hours.

The next ten days — 8 oz. milk, 4 crackers, 2 to 4 oz. sugar. Given every two hours.

The next month — In eight feedings, every two hours — (1) Indian meal mush with cream and salt (1 helping). (2) Eight ounces of milk with crackers and sugar. (3) Potato Purée. (4) Milk and whites of two eggs. (5) Soft Custard (1 serving). (6) Chocolate with cream (1 cup). (7) Pea Purée. (8) Milk, crackers and sugar.

The next four months — In six feedings a day. Add tapioca, boiled rice, macaroni, mashed potatoes, soft toast with butter, soft boiled eggs, wheat germ, shredded wheat.

THE LENHARTZ DIET

The "Lenhartz diet" begins with 100 c.c. milk and one egg daily, in teaspoonful doses, gradually increasing until at the end of four weeks a liberal mixed diet is allowed, always avoiding coarse vegetables and irritating substances.

The gradual increase of food appears in the accompanying scale.

In preparing the eggs they are beaten very light, *without salt,* a small amount of sugar frequently added, to bowl kept in a pan of cracked ice. At first the milk is given with shaved ice. Some of the milk, eggs, and sugar are made into custard on the tenth day. The beef is scraped and weighed after cooking; occasionally lime water has to be added to the milk, and, if large curds form, the milk is diluted with

[1] Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.

RECAPITULATION OF LENHARTZ' DIET

Day	Calories	Eggs	Milk c.c.	Milk oz.	Sugar	Scraped beef	Boiled rice gm.	Boiled rice oz.	Zwieback	Butter gm.	Butter oz.	Chicken gm.	Chicken oz.
1...	280	Raw 2	100	(3⅓)									
2...	470	Raw 3	200	(6⅔)									
3...	637	Raw 4	300	(10)	20 gm. (5 dr.)								
4...	777	Raw 5	400	(13⅓)	20 gm. (5 dr.)								
5...	966	Raw 6	500	(16⅔)	30 gm. (1 oz.)								
6...	1135	Raw 7	600	(20)	30 gm. (1 oz.)	36 gm. (9 dr.)							
7...	1580	Raw 4, soft 4	700	(23⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	100	(3⅓)					
8...	1720	Raw 4 soft 4	800	(26⅔)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	100	(3⅓)	20 gm. (⅔ oz.)				
9...	2138	Raw 4, soft 4	900	(30)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	200	(6⅔)	40 gm. (1⅓ oz.) or toast, 20 gm. (⅔ oz.)				
10...	2478	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	200	(6⅔)	40 gm. (1⅓ oz.) or toast, 20 gm. (⅔ oz.)	20	(⅔)	50	(1⅔)
11...	2941	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	300	(10)	60 gm. (2 oz.)	40	(1⅓)	50	(1⅔)
12...	2941	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	300	(10)	80 gm. (2⅔ oz.)	40	(1⅓)	50	(1⅔)
13...	3007	Raw 4, soft 4	1000	(33⅓)	40 gm. (1⅓ oz.)	70 gm. (2⅓ oz.)	300	(10)	80 gm. (2⅔ oz.)	40	(1⅓)	50	(1⅔)

14...Same as the thirteenth day.

barley water. Great care is exercised in the transition stages from liquids to semi-solids and finally to full diet.

CONVALESCENT GASTRIC DIET NO. 1

Dr. T. C. Janeway [1]

Breakfast:	Boiled milk with cocoa or coffee.
	Any cereal, strained, with cream.
	Soft toast, buttered.
11 A. M.:	Glass of milk.
Dinner:	Purée of potatoes, peas, or beans with toast soaked in it, or boiled rice, with milk or cream.
	Junket or custard, or jelly or tapioca pudding.
4 P. M.:	Glass of milk with beaten egg in it.
Supper:	2 soft-boiled eggs.
	Soft toast.
	Glass of milk.
9:30 P. M.:	Glass of milk, with beaten egg in it.

CONVALESCENT GASTRIC DIET NO. 2

Dr. T. C. Janeway [1]

Breakfast:	Boiled milk, with a little coffee or cocoa.
	Any cereal, strained, with cream.
	Dry toast, buttered.
	1 egg.
11 A. M.:	Glass of malted milk.
Lunch:	2 soft-boiled or scrambled eggs, or fresh boiled fish in place of eggs.
	A little broiled bacon (eating the fat and not the lean).
	Toast and milk.
Dinner:	Purée of potatoes, rice, barley, peas, asparagus, celery, or beans.
	Buttered toast.
	Rare beefsteak broiled, or lamb chop broiled, roast beef or lamb.
	Roast or broiled chicken or minced chicken, with well-cooked rice or a well-baked potato with butter.
	Junket or custard, jelly or tapioca pudding.
10:30 P. M.:	Glass of milk with lime-water.

[1] Dr. Theodore C. Janeway, "Diet Lists of the Presbyterian Hospital," 1917.

CHAPTER XVII

DIET IN INTESTINAL DISEASES

DIET IN DYSPEPSIA

Modern clinical medicine does not recognize such a disease as dyspepsia. In a great variety of local and general conditions digestion is more or less disordered. It may be too rapid, too slow, difficult, imperfect for one or more of the classes of foods, or abolished outright. Specialists base diets largely on the results of test-meals, so that the diet in a given case becomes individualized. If a person with ordinary symptoms of chronic indigestion is to be dieted, and the cause of the affection is not known, the regimen for chronic gastritis will answer. But if in addition to indigestion there is unusual irritability of the stomach, the diet must consist of most easily digested articles of solid food, and if necessary of semi-solid or liquid food. In other words, he is dieted like a convalescent from some severe acute disease, or a child at weaning time.

DIET IN CONSTIPATION

It is almost as difficult to prescribe a diet for constipation as it is for dyspepsia, and for the same reason, namely, constipation is not in itself a disease, but a symptom or result of many diseases. As a general rule, however, a certain diet is more or less suitable for any kind of constipation. By the latter term we usually mean a delayed action of the bowels due to a natural weakness of the muscles of the intestines, or to an acquired weakness due to too concentrated a form of nourishment or to a sedentary life. In a certain percentage of cases the delayed action of the bowels is due to temporary

spasm of the intestinal muscle and this may even occur in association with weakness of the muscle, as is seen in hysterical women. There is finally delayed bowel action in a great number and variety of diseases.

The resources employed in treating the diseases which cause constipation include many plans beside diet, yet the latter is indispensable.

A mixed diet is very necessary, for purely animal food products, as meat, fish, eggs, milk, cheese, etc., conduce to constipation because absorption of such foods is so nearly complete that not enough residue remains in the intestines to stimulate peristalsis. On the other hand, a diet of vegetables, involving a large indigestible residue, causes large fecal motions, but these are not promptly expelled unless the intestine is healthy. Much extra work is thrown upon the intestine when a vegetarian diet is used exclusively; and as a result of such excessive work the intestine may become in time weakened.

Constipation from whatever cause and of whatever nature may be, when sufficiently pronounced, sufficient to render a healthy man or woman sick. Digestion becomes impaired, appetite lost. This fact alone teaches us that in dieting a constipated subject we often have to deal with a sick individual. Hence the only course to pursue is to cure the condition which causes the constipation as soon as possible. For mere sluggish action of the bowels, not amounting to disease, many popular dietetic remedies are employed.

Of household dietetic procedures for securing daily evacuations, the most common is the drinking of cold water on rising — one, two or more glasses. To this a little common salt may be added. The use of fruit at or before breakfast often causes an evacuation during the day. This is true especially of apples, pears, oranges, etc. Buttermilk is also largely used for this purpose. The vegetable acids with the large amount of indigestible residue make certain fruits valuable as laxatives, although those berries which contain tannin as blackberries may tend to constipate. Dried fruits, such as

figs and prunes are especially useful. The efficacy of sweet cider seems to illustrate again the laxative power of vegetable acids. Very sweet substances in large amounts, chiefly honey and molasses, are notably laxative. Oatmeal, among the cereal foods, is noted for its laxative powers. Oils and fats are laxative to many people. A word of caution must here be inserted. Many of these substances occasionally behave as violent purgatives, especially in individuals who alternate between constipation and diarrhea. The severe diarrhea set up at times by sweet cider, molasses and other relatively inert substances should teach us caution in giving such articles to patients.

No more important hygienic regimen can be adopted than the following: 1. Eat fruit before retiring (experiment and find what fruit seems to agree). 2. Three-quarters of an hour before breakfast drink two glasses of cold water and exercise ten minutes in room before open window or take a brisk walk. If this regimen were followed daily by children and grown people there would be less illness.

DIET IN CONSTIPATION

Massachusetts General Hospital [1]

Plan diet in following manner, eating the usual quantity of foods presented and using the variety allowed in list:

Breakfast.— Cereal with cream and sugar — preferably corn meal, or rye and oats.
Two soft boiled or scrambled eggs.
Bread — Preferably black bread or pumpernickel, or rye bread, with much butter.
Fruit — Apples or grapes.

Dinner.— Soup — preferably vegetable soup.
Fish or meat, or both, with salad.
Vegetables — at least two kinds, preferably spinach, cabbage, beets, turnips, potatoes, beans or peas if desired.
Dessert of rice or bread pudding or custard — including daily a saucer of prunes or saucer of tamarinds.

Supper.— Bread and Butter.
Cocoa.
Cold meat and vegetable salad.
Dessert of stewed fruit—apples or pears or figs. If necessary, include a saucer of prunes or plums (preserved).

[1] Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.

Drink at least three pints of water daily.
Omit all drugs for constipation.
Agar Agar Powder — tablespoonful twice daily.

DIET IN DIARRHEA

The term diarrhea, like dyspepsia and constipation, represents only a symptom or result of various diseases. While this affection cannot be cured by a dietetic plan alone, attention to diet is very important. It consists as much in avoiding laxative articles as in using constipating articles which are also bland and easily digested. Food nearly all of which may be absorbed naturally antagonizes diarrhea from any cause. The commonest articles used in this class are flour porridge, cooked white of eggs, boiled milk, toasted crackers, zwieback, rice, chocolate. Meat should be of the most tender and digestible nature, as sweetbreads, tongue, tenderloin of beef, etc. Dried beef powder may be mixed with 5 per cent. tannic acid. Articles which naturally contain the latter are useful if digestible. Acorn coffee is recommended by some.

In a daily menu compiled by Ewald the following articles enter: Soft eggs, milk, toasted bread, zwieback, scraped beef, breast of chicken, the most digestible kinds of fish, soups and broths (to the latter may be added Sanatogen and other semi-proprietary condensed protein foods). Articles used in diet list for constipation must be avoided.

DYSENTERY

Dr. Thompson [1]

During an attack of acute dysentery the patient should be kept absolutely quiet in bed, and should not be allowed to rise for the movement of the bowels, making use of a bedpan instead. Throughout the active stage the diet must be strictly confined to easily digestible food, and in most cases it is wisest to give only predigested fluid articles. Peptonised or pancreatinised milk, or boiled milk, pressed-meat juice, whey, or raw egg albumin beaten with sherry and flavored

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

with nutmeg are recommended. Many patients do best upon a diet of raw scraped beef or meat balls.

In cases of acute dysentery, and especially in the amœbic form, the loss of strength, anæmia, and emaciation progress very rapidly, and the strength must be supported by stimulation, for which brandy is preferable to whiskey.

During convalescence the diet must be very cautiously increased, and confined to food which is promptly and completely digested, leaving but little residue. For this purpose animal food should be chiefly eaten, while fish, tender beefsteak, roast beef, boiled or broiled chicken, eggs, custard, blanc-mange, dry toast, junket, well-boiled rice, or wine jelly, may be given. All fruits and vegetables must be forbidden, and butter and cream should be taken sparingly.

If the the disease occurs in infancy, the child, if possible, should be fed at the breast. Otherwise all milk and water given should be pasteurized. Beef tea and mutton broth may be allowed in moderation, and special care should be observed not to overfeed.

DIET FOR ULCERATIVE COLITIS AND DYSENTERY
(Low Fat and Low Carbohydrate Diet)
Massachusetts General Hospital [1]

Breakfast.—	One large portion lean meat.
	Two thick slices of toast without butter.
Noon.—	Meat or fish.
	Two slices of toast.
	One potato or macaroni.
Night.—	Meat.
	Two slices toast.
	Custard or tapioca.

Later, add wheat or corn cereals, tapioca, rice, mild in moderation.

CHRONIC DYSENTERY
Dr. Thompson [2]

Chronic dysentery is often best treated by an exclusive milk diet of from two and a half to three quarts a day, with

1 Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.

2 W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

rest in bed or on the lounge. In other cases rare steak or roast beef or chicken and egg albumin may be allowed, with dry toasted, zwieback, or crackers. The milk and meat diet may be advantageously combined.

In Osler's opinion, if there is much ulceration of the colon, meat is not well borne, and it is better to keep the patient upon a diet which will give but little residue, such as boiled or peptonised milk.

The stools must be examined every day or two to ascertain the presence of undigested fragments of milk curds or meats, oil globules, mucus, blood, etc. If improvement does not occur, the patient may be put upon a diet of egg albumin or Sanatogen with beef juice, or some of the preparations of beef meal or peptonoids, with pancreatinised milk. Return to solid diet must be very gradual, and may be conducted on the lines directed for convalescence from typhoid fever.

ENTERIC DIET

Dr. Vickery [1]

Whey, 7 ounces. Barley water, 8 ounces. Beef juice, 3 ounces. Buttermilk, 6 ounces. Gruel, 16 ounces. Junket, 8 ounces.

SPECIAL ENTERIC DIET

Dr. Cutler [2]

Skimmed Milk	8 oz.	at 7 A. M.
Mellins' Food	8 "	" 9 "
Skimmed Milk	8 "	" 11 "
Eggs and Milk	8 "	" 1 P. M.
Beef juice	3 " with	
Barley water	3 "	" 3 "
Skimmed Milk	6 " with	
Tea	½ "	" 5 "
Chicken Broth	4 " with	
Barley Water	3 "	" 7 "
Buttermilk	8 "	" 9 "
Skimmed Milk	8 "	" 11 "
Beef Tea	8 "	" 1 A. M.
Skimmed Milk	8 "	" 3 "
Albumin Water	8 "	" 5 "

1 Dr. Vickery: "Diet used at the Massachusetts General Hospital, Boston," 1917.

2 Elbridge G. Cutler, M.D.: "Diet used at the Massachusetts General Hospital, Boston."

LIQUID ENTERIC DIET

Dr. Cutler [2]

Skimmed Milk	8 oz.	4 times every 24 hours.
Skimmed Milk	6 " with	
Tea or Coffee		2 " " "
Beef Tea	8 "	1 " " "
Chicken broth	3 " with	
Barley Water	3 "	1 " " "
Mellins' Food	8 "	1 " " "
Albumin Water	8 "	1 " " "
Beef juice	3 " with	
Barley Water	3 "	1 " " "
Buttermilk	8 "	1 " " "

One soft boiled egg daily if desired or raw in milk.

SCHMIDT'S INTESTINAL TEST DIET

This is not necessarily a series of test meals, such as are employed for diagnosis in diseases of the stomach, for it may be used as a steady regimen, the test of the efficacy of which is shown by the character of the stools, which should consist in health only of the indigestible residue of the food. It is adapted to the healthy, as well as to those with intestinal disorders. All foods with considerable amounts of indigestible residue are forbidden, but no attempt is made to eliminate all residues, for such a step would favor the occurrence of constipation. The diet should be properly balanced and contain sufficient calories for the daily requirement.

The diet as advocated by Schmidt has been in use in a slightly modified form at the Massachusetts General Hospital. Instead of oatmeal gruel, corn meal mush is used; while mashed potatoes are substituted for potato broth. In subjects with intestinal affections, the failure to digest some or more of the principal classes of foods, as shown by study of the feces, leads to a change in diet. Many normally healthy subjects may benefit by such a diet, which may be rendered less monotonous by introducing alternate dishes.

TEST DIET FOR STUDYING THE FUNCTION OF THE ALIMENTARY TRACT

Massachusetts General Hospital [1]

Morning.— Zwieback 50 gms.
Milk 200 c.c.
1 egg.
3 tablespoonfuls of Indian meal mush made with 10 grms. butter and 200 grms. milk.

11 A. M.— Milk 1 pint.

Noon.— Hamburg Steak, 125 grms.
On toast with 20 grms. butter.
Mashed potatoes with 10 grms. butter.

4 P. M.— Milk 1 pint.

Supper.— Same as breakfast.

VALUE OF DIET, APPROXIMATELY

Protein, 105, Fat 125, Carbohydrates 220, Calories 2500.

DIET FOR INTESTINAL PUTREFACTION

As putrefaction is limited chiefly to animal proteins, an antiputrefactive diet is a restricted vegetarian diet in which milk, cheese and eggs are allowed in small quantities, but no meats. The patient lives principally upon bread, potatoes, cereals, fruits, and green vegetables. Such a diet agrees closely with those in use for Bright's disease, high blood pressure, the self poisoning of pregnancy, and in fact, in any condition supposed to be caused or aggravated by excess of animal protein.

DIET FOR INTESTINAL PUTREFACTION

Dr. Max Einhorn [2]

Breakfast.— *Fruit:* Apple, banana, pear, grapefruit, orange.
Cereal: Oatmeal, farina, shredded wheat: with milk or cream.
Bread and *Butter.*
Tea.

Dinner.— *Soup:* Vegetable soup.
Eggs: (2) Soft boiled, coddled or scrambled.
Potatoes, Rice or Spaghetti.
Green Vegetables: String beans, cauliflower.
Baked Apple.
Coffee with milk.

[1] Diet used at the Massachusetts General Hospital, Boston, Mass., 1917.
[2] Dr. Max Einhorn, Professor of Medicine, New York Post Graduate School of Medicine. Physician to Post Graduate and German Hospital, 1917.

Supper.— Cereal: Oatmeal, farina, shredded wheat: with milk or cream or butter.
Cheese.
Stewed Fruit.
Bread and Butter, Rice and Milk.

APPENDICITIS

Dr. Thompson [1]

Dietetic Treatment. The dietetic treatment of appendicitis, which has not yet passed into the surgeon's hands, should consist in giving only such foods as will be thoroughly absorbed, leaving as little residue as possible to irritate the lower bowel and excite peristalsis.

Until the outcome of the attack is decided it is best to put the patient upon a fluid diet, consisting chiefly of nutritive broths. Beaten eggs may be allowed, and a moderate quantity of pancreatinised milk, whey, or buttermilk. Cocoa may be given, and strained gruels of rice and barley.

In recurrent cases the patient should be cautioned to eat moderately and avoid all coarse or hard food, such as grits, coarse oatmeal, tough meats, fibrous vegetables, the skin of fruits or potatoes — in short, everything likely to overload the intestine with accumulated waste.

The operative cases should have the diet recommended after laparotomy. Usually the digestive organs require almost absolute rest for twenty-four hours after the operation, and hot water may be sipped. No food at all should be given for fully six hours before operation.

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

CHAPTER XVIII

DIET IN DISEASES OF THE GENITO-URINARY SYSTEM

ACUTE BRIGHT'S DISEASE

In dieting a patient suffering from acute Bright's disease, one fact to be kept prominently in mind is the difficulty that the system has in getting rid of its waste material — especially of its nitrogenous waste. Another point is that the diet should be such as to assist in carrying off those inflammatory products by which we know that the tubules of the kidneys are to a greater or less extent blocked. The amount of nitrogenous elements in foods must be kept down, and aid must be given for washing out the products of inflammation from the uriniferous tubules.

Water is the best diuretic.— Hot water and hot diluent drinks.

Diluted milk is the food that answers best, and skimmed milk has a high reputation as a diuretic. Buttermilk, whey and kumyss are useful.

From two to three pints of milk, well diluted, given in the twenty-four hours, will in most cases be sufficient at first, but if the disease be protracted and tends to become chronic, a more liberal allowance of liquid food must be ordered, and broths may be added to the dietary. When milk alone is given it should be given in divided quantities at stated intervals — half a pint every three or four hours, diluted with half as much hot water or effervescing water.

Between supplies of milk drink freely of diluent drinks.

Diluent Drinks. Plain water, toast water, barley water, cream of tartar and lemon drinks, and the acid drinks are all useful diluents.

Give between meals and drink *slowly.*

CHRONIC BRIGHT'S DISEASE

The kidneys are great agents in the work of excreting nitrogenous waste, and if these organs become clogged with accumulation of nitrogenous waste products they are not able to perform their functions.

As soon as we have evidence sufficient to prove that the kidneys are laboring and are burdened by their work, we must endeavor to remove the strain by regulating the diet; and one clear indication is to *limit* the supplies of nitrogenous foods.

Large amounts of animal food and the use of alcohol must be stopped.

In many cases the effect of feeding the patient for six weeks, or even two or three months, upon an exclusive milk diet, is remarkably gratifying. The quantity of milk to be prescribed for an exclusive milk diet in Bright's disease must depend on the age and size of the patient, as well as upon his ability to take exercise and use up force in muscular energy. If the patient is invalided so as to be confined to his room or the house, from five to seven pints of milk daily are quite sufficient. If the patient loses weight on a milk diet, although it otherwise agrees with him, it may be well to add farinaceous food in the shape of rice or bread. In the worst cases it is desirable to give the milk at brief intervals, in quantities of six ounces, once an hour during the daytime, with an extra tumblerful at night, and on awakening in the morning.

The quantity of milk necessary to support life for any length of time and maintain good nutrition, especially if the patient is exercising at all, is considerable, and he must take from fourteen to eighteen, or even twenty-two six-ounce tumblerfuls of milk in the twenty-four hours.

It is usually impossible to commence at this rate without producing gastric disturbances from souring of the milk in the stomach, and possibly diarrhœa. The latter symptom is an almost certain indication that the milk is being imperfectly digested, and a temporary reduction in its quantity is advised.

In very advanced cases when the ability of the kidneys to excrete protein has passed a certain stage a pure milk diet is out of the question, since it contains far too much protein. See Diet lists.

As the patient improves the milk diet may be given up, but it should never be too suddenly abandoned In adopting any other diet it is a good rule never to let the nitrogenous food bear a greater proportion to the non-nitrogenous than one to four.

When, after a milk diet, the change is to be made to a more liberal *menu,* the hours of taking the milk may be reduced in frequency, and some of the milk may be replaced by the more hearty food.

DIET: *Soup.*— Vegetable or fish soup, broths with rice or barley.

Fish.— Raw oysters or clams, fresh fish broiled or boiled.

Meats.— Eat sparingly, chicken, game, fat bacon, fat ham.

Farinaceous.— Stale bread, whole wheat bread, toast, milk toast, biscuits, macaroni, rice, cereals of all kinds.

Vegetables.— Onion, cauliflower, mashed potatoes, mushrooms, lettuce, watercress, spinach, celery, cabbage.

Desserts.— Ripe raw fruits, stewed fruits, rice, tapioca, bread and milk puddings, junkets, cocoa.

Liquids.— Toast water, weak tea, pure water, peptonised milk, malted milk, fresh buttermilk, milk with hot water equal parts, whey, unfermented grape juice.

AVOID.— Fried fish, corned beef, hashes, stews, pork, veal, heavy bread, batter cakes, lamb, mutton, beef, gravies, beans, peas, malt or spirituous liquors, tobacco, coffee, ice cream, cake, pastry.

STANDARD PARENCHYMATOUS NEPHRITIS DIET

All Food to be Salt Free

New York Post Graduate Hospital [1]

7 A. M.	Cocoa	180 c.c. (6 oz.)
	Bread or Toast	30 g.
	Butter	15 g.
	Cereal	100 g.
10 A. M.	Cocoa	180 c.c. (6 oz.)
	Matzoths	1
	Butter	10 g.

[1] Diet used at the New York Post Graduate Hospital, New York City, 1917.

12 M.	Cream of Vegetable Soup ....240 c.c.	(8 oz.)	f
	Baked Potato or Boiled Rice ......130 g.	(Approximate)	
	Bread or Toast .... 30 g.		
	Butter .... 20 g.		
3 P. M.	Cocoa ....180 c.c.		
	Matzoths 1		
	Butter .... 10 g.		
5 P. M.	Milk ....180 c.c.		
	Cream of Wheat or Rice ....100 g.		
	Sugar .... 10 g.		
	Cream .... 30 c.c.		
	Bread or Toast .... 30 g.		
	Butter .... 20 g.		
	Stewed Prunes or Apricots ....100 g.		

The cocoa used is to be prepared as follows:

Cocoa ....2 tsp.
Sugar ....1 "
Hot Water ..¼ C.
Milk ....½ C.

Level measure of cocoa, sugar, water, and milk. Mix cocoa, sugar, and hot water. Cook over flame three minutes. Add milk and heat in double boiler to boiling point. Two drops of vanilla may be added as flavor. Beat with Dover beater before serving.

STANDARD INTERSTITIAL NEPHRITIS DIET [1]

New York Post Graduate Hospital

To be in all respects similar to the Parenchymatous Nephritis Diet, except that the food is *not* to be prepared salt free, and bread or toast may be substituted for Matzoths.

DIET IN UREMIA

A special diet is indicated when uremia is actually present, and when certain symptoms point to its actual approach; also probably when blood and urine tests show that uremia will probably develop within a short time.

[1] Diet used at the New York Post Graduate Hospital, New York City, 1917.

UREMIC DIET [1]

Material	*Weight*	*Measure*	*Percentage of* *Protein*	*Fat*	*Carbo-hydrates*	*Cal-ories*
Lemonade		Juice of				
Lemon Juice		6 lemons			9.8	60
Sugar	224 gms.				100	918
Water		1 Litre				
Cornstarch Blanc Mange						
Cornstarch	112 gms.				90	413
Sugar	154 "				100	631
Water		1 Litre				
Lemon Juice		30 c.c.				
						2022

Divide into five equal portions, feeding at 8 A. M., 10 A. M., 12 M., 3 P. M., and 6 P. M.

Method of making Cornstarch Blanc Mange:

Mix cornstarch, sugar and 230 c.c. of cold water to a smooth paste. Pour 750 c.c. of boiling water over it gradually, stirring constantly. Cook over flame until it thickens, meanwhile stirring constantly. Then place over hot water 30 minutes. Add lemon juice before serving.

ALBUMINURIA

Thompson [2]

Dietetic Treatment. The frequent return of functional albuminuria should be regarded as an indication of special weakness of the kidneys in the same way that frequent glycosuria invites suspicion of the strength of the digestive power of the liver, and it demands a careful regulation of the diet. Meat should be reduced in quantity, or temporarily forbidden, as well as all forms of alcoholic drinks, or other substances liable to produce renal irritation, and the diet should consist chiefly of fruits, vegetables, and milk. Careful attention must be paid to increasing the activity of the bowels.

[1] Diet used at the New York Post Graduate Hospital, New York City, 1917.
[2] W. Gilman Thompson, M.D.: "Practical Dietetics." New York, D. Appleton & Co.

When functional albuminuria is observed in children and adolescents the following dietary from which a variety of foods may be selected is recommended.

Diet: — Bacon, sweetbreads, custards, butter, cream, milk, cereals and breadstuffs, gingerbread, potatoes, celery, blanc-mange, Bavarian cream, whipped cream, and sponge cake. Wine or lemon jelly, junket, bread pudding, apple sauce, oranges, ripe bananas, pineapple juice, prunes, cocoa, lemonade, orangeade.

CHAPTER XIX

DIET IN MISCELLANEOUS AFFECTIONS

NERVOUS DISORDERS

Dietetic Treatment. The first thing to be done for a person suffering from nerve exhaustion is to adopt a dietary and a habit of life, that will rebuild the nerve cells. The lost energy must be gently and slowly "coaxed" back — not through medicines, but through proper environments, proper employment and proper food. There is no disease that requires so little medicine as nerve exhaustion. The dietary should be simple and nutritious, abounding in lettuce, parsley and the fresh green edibles in season. If there is much intestinal disturbance, foods that are rich in starch should be discarded. Active stimulants should be entirely eschewed. Take freely of unfermented grape juice, malted milk and Sanatogen in milk or Vichy.

In functional nervous disease, such as hysteria and hypochondriasis, the appetite, muscular elasticity, and mental powers will often be observed to be deficient in the early part of the day, and to recover their tone in the evening. At this latter time, therefore, it is advisable to make the principal meal.

DIET IN SKIN DISEASES

Nearly all affections of the skin of constitutional or reflex (gastro-intestinal) origin, especially acne, eczema, psoriasis, seborrhœa capitis, pruritus, urticaria, etc., improve under dietetic measures and often recover under these alone. While no special plan applies to all, the elimination of sugar and sweets of all kinds, and substances rich in fat, as cheese, nuts, fried articles, etc., is essential. Pure fats like butter, cream, salad oil, etc., are, however, well enough in small

amounts. Malt liquors and sweet wines disagree, largely because of the sugar therein; but alcohol itself is also prejudicial in many cases.

It is well to take all food in small rations, and masticate it thoroughly; for the prejudicial effect of food in skin diseases is often directly attributable to fermentation, favored by atony of the digestive tract, dilated stomach, constipation, etc. Physical exercise is of great benefit in most of these cases.

The diet and other regimen in skin diseases is much like that for obesity, gout and diabetes. All these metabolic disorders tend to produce skin diseases.

DIET FOR CANCER OR SKIN DISEASES [1]

First Day

Breakfast.— 4 ounces rice, 3 ounces corn bread, 1¼ ounces butter, ½ ounce sugar, hot water.

Dinner.— 5 ounces vegetable soup, 3 ounces baked potatoes, 3 ounces stewed celery, 1 ounce graham bread, 1¼ ounces butter, 1 fresh apple.

Supper.— 4 ounces rolled oats, 2 ounces white bread, 1¼ ounces butter, 4 ounces stewed prunes, ¼ ounce sugar, very weak tea.

Second Day

Breakfast.— Orange, 4 ounces hominy, 2 ounces graham toast, 1¼ ounces butter, ½ ounce sugar, postum.

Dinner.— 5 ounces pea soup, 3 ounces macaroni, 3 ounces string beans, 3 ounces carrot, 2 ounces bread, 1¼ ounces butter.

Supper.— 4 ounces cream of wheat, 2 ounces graham toast, 1¼ ounces baked apple, 2 ounces crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

Third Day

Breakfast.— Banana, 4 ounces Pettijohn, 2 ounces white bread, 1¼ ounces butter, ½ ounce sugar, hot water.

Dinner.— 5 ounces corn soup, 3 ounces baked potato, 3 ounces spinach, 3 ounces boiled onion, 2 ounces bread, 1¼ ounces butter, raisins.

Supper.— 4 ounces farina, 4 ounces stewed figs, 2 ounces graham cracker, 1½ ounces butter, ¼ ounce sugar, very weak tea.

1 Diet used at the New York Skin and Cancer Hospital, New York, 1917.

Fourth Day

Breakfast.— Raw apple, 4 ounces cornmeal mush, 2 ounces graham bread, 1¼ ounces butter, ½ ounce sugar, postum.

Dinner.— 5 ounces vegetable soup, 4 ounces baked beans, 3 ounces cauliflower, 3 ounces asparagus, 2 ounces bread, ¼ ounce butter, orange.

Supper.— 4 ounces rice, 4 ounces stewed prunes, 2 ounces graham cracker, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

Fifth Day

Breakfast.— Orange, 4 ounces cracked wheat, 3 ounces corn muffins, 1¼ ounces butter, ½ ounce sugar, hot water.

Dinner.— 5 ounces sago soup, 4 ounces spaghetti, 3 ounces lima beans, 3 ounces boiled onions, 1¼ ounces butter, dates.

Supper.— 4 ounces cream of wheat, sliced orange, 2 ounces oatmeal crackers, 1¼ ounces butter, ¼ ounce sugar, very weak tea.

Sixth Day

Breakfast.— 4 ounces samp, 2 ounces graham toast, 1¼ ounces butter, ½ ounce sugar, Postum.

Dinner.— 5 ounces celery soup, 4 ounces baked potatoes, 3 ounces carrots, 3 ounces spinach, 1¼ ounces butter, 2 ounces bread.

Supper.— 4 ounces wheatena, 4 ounces stewed figs, 2 ounces Uneeda Biscuit, 1¼ ounce butter, ¼ ounce sugar, very weak tea.

DIETETIC MANAGEMENT OF SURGICAL CASES

Not much special attention is paid to dietetics until a day or two before operation, with the exception of stomach cases. Whenever a patient is to be operated on for a stomach affection, many surgeons advocate the free use of articles rich in vegetable acids, believing that such articles are natural antiseptics for the stomach and intestines. These substances, while technically acids, are quickly changed to alkalies in the body, and tend to lessen the total acidity of the latter. Some German surgeons even allow such patients to eat freely of sauerkraut, sour milk, etc.

In other cases, the patient is placed in bed, or is in complete rest for several days, and fed on very simple and nutritious articles in moderate quantities only. The old custom of fattening or building patients up before operating on them has largely died out. If the bad general state of the patient

is due to the condition which is to be operated on, nothing is gained by such attempts. In the case of a rapidly progressing disease, every hour lost before operating may diminish the chance for recovery, immediate or ultimate. If the patient is in bad condition for withstanding an operation, he may often be operated on safely under local anesthesia. There are many resources to-day for minimizing the dangers of shock and hemorrhage. As a general rule the sooner a patient is operated on, the better, irrespective of the urgency of the condition. To live for weeks and months in anticipation of an operation is believed by its depressing effect to offset alleged attempts at strengthening patients.

When a general anesthetic is to be given the patient must fast beforehand to such an extent that the stomach is empty at the hour of anesthesia. As operations are usually performed in the forenoon, the patient should take but little supper and no breakfast. Should the operation be performed late in the day, he may have a light breakfast.

In emergency operations, the patient having taken food within six hours, the stomach should first be washed out. This is also done as a routine procedure in all operations involving the stomach itself. Water may be given at any time. After the operation there is such a natural tendency to nausea that little or no attempt should be made to feed the patient for some hours. Only in exceptional cases in which the stomach is not upset and the patient complains of hunger, a little tea and toast, or milk may be given. In the great majority of cases no food is given until the following day.

As soon as the stomach will tolerate it, however, simple nutritious food should be given in proper amounts. The tendency to-day is toward getting up early after operations, and against everything which tends to make the patient passive and bedfast. The patient therefore needs more food than if he were to be bedridden.

In patients who from any reason are unconscious or delirious after operation, some plan of artificial treatment is

necessary, involving the use of the nasal, stomach or rectal tube.

In any condition in which post operative vomiting will undo the results of operation, the diet should be extremely light and bland until healing has occurred, and it may be necessary to feed by the rectum. If the patient is unable to masticate he must be given only liquid or very soft foods.

As a rule, when post operative feeding is left wholly to the discretion of the nurse, a certain rule is adopted as follows:

No food at all for the first twenty-four hours. Water may be given in sips for the intolerable thirst and in addition to plain water, the patient may receive a swallow of carbonated water, cracked ice, a little hot tea or black coffee, or some alcoholic stimulant. Toward the end of the period a teaspoonful or two of milk diluted with lime water may be given.

During the second twenty-four-hour period about one-half a pint of milk or some other liquid food may be given in small doses and this amount may be doubled on the third day.

The third or fourth day usually coincides with normal bowel action, the patient having received laxatives on the day preceding. The patient as soon as this has occurred may go upon a semi-solid diet, so increased as to be regular at the end of a week or ten days.

The diet varies notably with the patient and the kind of operation and its outcome and the responsibility for special provisions suited to individual cases falls upon the medical attendant and are modified from day to day under his directions.

DIET AFTER LAPAROTOMY, OVARIOTOMY, ETC.

Dr. Thompson [1]

After all operations involving opening the peritoneal cavity complete rest of the stomach is necessary for at least four

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

or six hours, and not infrequently for two or three days. Food and stimulants may be given by enemata. If fed per os for the first three days, not over a tablespoonful of pancreatinised milk or milk with lime water or barely water should be allowed, once in two or three hours. Later the quantity may be increased and the intervals diminished, and beef tea, beef peptonoids, and egg albumin may be added.

In these cases the duration of anesthesia has usually been prolonged, and the shock is considerable. The danger from the occurrence of vomiting, fermentation of food, and flatulent distention of the abdomen is far worse than that of inanition from abstinence. It is well also to precede the operation by a day or two of dieting in order to lessen the bulk of intestinal waste matter. To this end the diet should, when possible, consist chiefly of lean meat and dry toast, vegetables and especially sweets being avoided.

After wounds and operations affecting the stomach or intestines no food at all should be given by the mouth. Nothing but a little cracked ice should be so administered, and all nourishment must be supplied for several days by the rectum. The return to mouth-feeding must be made very slowly and cautiously by at first giving not over one or two tablespoonfuls of pancreatinised milk or beef juice at a time.

There is often much thirst following operations involving the peritonæum, which is relieved more by hot fluids than by ice, which sometimes irritates the throat and increases the desire for drink. If there is danger of all fluids exciting emesis, a salt-water enema once in three or four hours will alleviate thirst.

CHAPTER XX

DIET IN SPECIAL CONDITIONS

MOTHERHOOD

DIET IN PREGNANCY

It is necessary to adopt a specific diet for pregnancy only when complications arise. If serious vomiting occurs in the early months, this disorder should be treated in the manner described in the following article. If albuminuria is discovered, meat and other nitrogenous food must be restricted in accordance with directions given for albuminuria. If the patient becomes anæmic, without albuminuria, milk, eggs and other iron-bearing foods should be eaten in abundance, particularly such vegetables as spinach and celery, and fruits including oranges and dates. In cases where constipation must be remedied, fruits, vegetables, and coarse cereals such as oatmeal and wheaten grits, will be of service. The "longing" of pregnant women for various indigestible articles such as pickles, chalk, etc., is largely mythical, and occurs, if at all, only as an accompaniment of a general hysterical condition, not as a peculiarity of the period of pregnancy.

A few general rules for wise eating would certainly include the following:

1. Let the diet always be simple and easy of digestion.

2. Be sure that it furnishes abundant fuel value, since carrying the unborn child increases the energy requirement of pregnant women about 10% over the normal.

3. Include in the dietary foods high in calcium and phosphorus; among the former are milk, orange juice, and such vegetables as celery, cauliflower, asparagus, lettuce, and spinach; among the latter, fish, lean beef, lettuce, spinach,

rutabagas, and parsnips. The skeletal lime supply and sometimes the teeth of the pregnant woman are called upon to furnish calcium for the unborn child, if the food does not supply enough lime. During periods of insufficient phosphorus assimilation, there is also skeletal lime-waste.

4. Never eat when tired, and do not overload the stomach.

The diet as a whole, then, must be digestible, and sufficiently high in nourishment and mineral content to keep the patient in good condition.

VOMITING — SEASICKNESS — VOMITING OF PREGNANCY

Thompson[1]

The first principle in the dietetic treatment of vomiting from any cause is to give the stomach rest. If it has been overloaded with a large bulk of food, or with indigestible material, it is well to encourage emesis, and distressing retching may be overcome by taking large draughts of lukewarm water. A quart or two will rinse out the stomach and allay irritation to a marked degree.

Well nourished patients when serious vomiting first occurs should usually refrain from taking food of any kind for from ten or twelve or even twenty-four hours. Exceptions to this rule are sometimes found in that type of seasickness, and sometimes in the vomiting of pregnancy, in which, as soon almost as the stomach is emptied, there is a desire to replenish the loss.

In any case in which the gastric irritation is persistent, it is necessary to give fluid food, and only in small oft-repeated doses, preferably in predigested form. The food is best given cold, as a rule, although some persons can relieve nausea by sipping very hot water.

A teaspoon of prepared milk, or in extreme cases but a few drops, given with a medicine dropper once in ten or fifteen minutes, may be all that the stomach will at first tolerate.

The following is a list of dietetic substances which are

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

commonly prescribed for the relief of nausea and vomiting, or for nourishment while those conditions exist: Cracked ice; pancreatinised milk; milk with sodium bicarbonate (ten grains), and cerium oxalate (five grains); milk and lime water; Vichy or milk with Sanatogen; milk and Vichy, soda, seltzer, or carbonic-acid water; kumyss and zoolak; beef extracts; raw meat pulp, scraped; strong black coffee; sour lemonade or lemonade and Vichy; clam broth. Dry crackers, dry toast, and ginger snaps will sometimes be retained in seasickness, or a cracker buttered and sprinkled with a little Cayenne pepper; brandy and soda; iced dry champagne; iced brandy diluted with water, soda water, or White Rock water.

Very severe and protracted cases may require lavage or nutrient enemata. Vomiting after abdominal surgical operations is often controlled by lavage.

DIET FOR THE MOTHER AFTER LABOR

Immediately after labor in normal cases a milk diet is given for the first six hours; at the end of that time, regular diet. The regular diet should include stewed fruits, and cereals given frequently; eggs, vegetables which are easy of digestion, and very little meat — no veal nor pork. Plenty of milk should be supplied.

In abnormal cases the diet is prescribed by the physician.

In cases of severe engorgement of breasts, fluids are restricted; a dry diet is given, which consists of the regular diet, and one glass of milk with each meal; no tea nor coffee, and no fluid between meals.

In cases of eclampsia milk is always given, and also a large quantity of water, either hot or cold, and cream of tartar drink.

DIET OF A NURSING MOTHER OR WET NURSE

Thompson [1]

The diet of the nursing mother or wet nurse must be regulated to prevent noxious substances from passing into the

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

breast milk, and to keep her in good health, so that she does not suffer from constipation, indigestion, or anæmia. Her weight should not alter, and if she has menstruated once or twice the milk changes and may disagree.

If milk does not make her constipated or bilious, she may drink it abundantly. Cream, cocoa, and chocolate are all valuable in the diet. She may take gruels and meat broths, and she should eat simple nourishing food, meat, eggs, vegetables, and fruits. The latter, even if sour, do not react unfavorably upon the child, provided the mother's digestion is good, and they serve to keep the child's bowels active. A high supply of calcium is still necessary, for the mammary glands, during their activity, are a severe drain on the skeletal lime unless an abundance is offered for assimilation from the food. Accordingly the vegetables and fruits named before are a necessary addition to the diet. A liberal supply of iron is also very desirable. The iron of meat, occurring in the blood which is not very easily digested, is less available than the iron of eggs, vegetables, and fruits. The mother should forego the drinking of much tea and coffee. Beer and wine also should not be drunk unless they are especially prescribed as a tonic. Wet nurses often demand beer, ale, or porter with their meals if they have been accustomed to it; but the popular idea that such beverages are especially beneficial is fallacious. Malt liquor sometimes causes the secretion of more milk, because more fluid is drunk, but the milk is no better for it. A reasonable quantity of fluids should be drunk, however, or the secretion of milk will suffer. The fluid may be in the form of plain or effervescing water, milk, soups, etc.

The mother or wet nurse should avoid all fatigue, worry, and emotional excitement of any kind, which may inhibit her digestive functions, and should take daily outdoor exercise.

On the whole, the best indication for the dietetic treatment of the wet nurse is the study of the condition of the child's digestion, bowels, and nutrition. A too meager diet for the

nurse is soon evident in lack of nutrition and development of the infant.

Drugs in Human Milk. Not many drugs pass unchanged into the milk which are likely to poison the child through its food, but there are some which should be carefully avoided on this account. Such are belladonna, opium, morphine, and other alkaloids; iodin and its preparations; mercury and its salts; salicylic acid.

When, for any reason, it becomes necessary to discontinue the nursing and to stop further secretion of milk, the diet should at once be made as dry as possible, and a minimum quantity only of fluid is allowed.

CHAPTER XXI

INFANT FEEDING

PROCESS OF DIGESTION*

In order to comprehend the principles which underlie the proper feeding of infants, it is well to understand what is involved in the process of digestion and what food elements are needed for the growth, maintenance, and repair of the body.

Digestion is the process or series of processes by which the food eaten is changed into the forms in which it can be absorbed by the tissues of the body. This is a most intricate operation, involving the use of many organs and functions, but one which takes place without difficulty in the healthy human body. But since all the complicated machinery necessary for digestion must be started at once, and since, necessarily, the organs of a newborn baby can be but feeble, it stands to reason that the food presented to him must be especially adapted to his needs. This food must be liquid; it must also contain the five essential elements which the human body requires for maintenance and growth, namely, the fats, sugars and starches, which furnish the necessary fuel for energy; the proteins, or muscle-forming foods; the mineral salts needed for the growth of all tissues and regulation of body processes and, lastly, a great amount of water. All these are found in milk, and in no other food which the in-

Star (*) indicates quotations from "Infant Care" issued by the U. S. Department of Labor, Children's Bureau, Washington, D. C. (Care of Children, Series No. 2, Bureau Publication No. 8.)

References to "Parental Care" issued by the U. S. Department of Labor, Children's Bureau, Washington, D. C., are made in this chapter, copies of same can be secured by writing to the department.

fant is capable of digesting. Therefore milk is the one proper infant food.

BREAST FEEDING*

The milk necessary for the normal healthy growth of every infant mammal, including the human species, is created for it in the breast of its mother. The milk of the cow, mare, ass, goat, and other animals has been analyzed by many investigators, to see whether any one of them bears so close a resemblance to human milk that it may be used as a substitute. All these investigations show that the milk of each animal is different from that of every other, and each is especially adapted to the requirements of the young of that species. No other argument than this simple physiological one should be needed to induce a thoughtful mother to nurse her baby at the beginning of his life, but if further demonstration is needed the evidence on every hand of the comparative failure of artificial feeding, at least as far as young babies are concerned, should be convincing.[1]

Statistics gathered from this country and many others show that breast-fed babies have a much greater chance for life than those who are bottle fed, and also that the infant illnesses, not only those of the digestive tract but many other varieties, afflict bottle-fed infants much oftener and much more seriously than those who have breast milk. But not only does breast milk protect the nursing baby from illness and increase materially his chance for life, but it practically insures that his development shall proceed in a normal orderly fashion.

The body makes a greater proportional growth during the first year of life than during any other, and the brain increases more in the same time than in all the rest of the years of life put together. It is therefore of the utmost importance to the whole existence of each individual that during this most critical period the baby be surrounded with all the necessities for perfect health. The most important of these

[1] See Prenatal Care, pp. 32–35, for consideration of breast feeding as affected by prenatal conditions.

necessities is breast milk. Food is the one question of overwhelming importance to the baby. If the food is one to which the digestive apparatus must learn to accommodate itself, or one which is lacking in some of the elements necessary for growth and development, the natural processes are hindered, and if illness comes, they are seriously interfered with, sometimes to an extent which makes it difficult, if not impossible, for the baby entirely to regain the lost ground. To accustom the infant organs to do their work properly at this critical, formative time is essential to the health of the adult in no small degree. Undoubtedly in many cases grown people would have escaped many of the defects and deficiencies with which they have to contend if they had passed the period of infancy in perfect health.

These are the impelling reasons why mothers should nurse their babies. Other less important reasons are that if the mother takes care of the baby herself it is much easier to nurse than to feed by a bottle; that breast milk is practically free from disease germs, and that it is fed to the baby at a uniform temperature from beginning to end of the nursing.

NURSING MOTHER*[1]

The majority of mothers can nurse their babies, at least in part, if they have suitable care and advice. What is chiefly required is that this conviction should enter the mind of the mother and abide there; for the fear that she will not be able to perform this function, or that the milk will not or does not agree with her child, has more to do with the supposed inability to nurse than any other one factor. The gland which secretes maternal milk is a wonderful and delicate mechanism. So intimate is the connection of the mammary nerves with the mind that the mental states of the mother are readily reflected in their function. Fear, anger, or worry may serve to check the secretion of the milk, or to change its quality so much that, for the time being, it is unfit for use, while, on the other hand, a calm mind, joy, laughter,

[1] See Prenatal Care, pp. 32–35.

and delight in life, coupled with the desire and intention to nurse the baby, will make it possible to do so. Failing this spirit, all other measures may prove futile.

The secretion of milk is induced by the efforts of the baby to nurse, and therefore he should be put to the breast regularly for at least two weeks after birth, even if only a very little milk is secreted. This patient effort, with proper food and care, coupled with the determination to succeed, will usually result in a good supply of milk, and no physician or nurse who appreciates the value of breast milk for the baby will counsel another course. It is rarely true that the mother's milk does not agree with the baby. It is much more often deficient in quantity than in quality. The return of menstruation may lead to a slight temporary disturbance, but it is not a sufficient cause for weaning.

Diet. A nursing mother should have a light, abundant, and appetizing diet, and such a one as causes her no indigestion. Disturbances in the digestive tract of the mother are quickly reflected in the baby's condition, and therefore the mother should refrain from eating or drinking those things which she knows from experience she can not digest. As a rule, indigestion in the mother, which shows itself in constipation, eructations of gas, headache, diarrhea, and the like, is caused by such foods as heavy puddings or underdone pastry; doughnuts; fried food soaked in fat; made dishes, such as croquettes and fritters; pickles, mincemeat, baked beans, pork and cabbage, and other heavy or poorly cooked foods; but people differ greatly in their power of digestion, and what will suit one person may upset the next. Overeating may be a cause of indigestion.

A mixed diet of such digestible and nutritious foods as are readily available is desirable for the nursing mother. All foods are milk-making foods. Emphasis should be laid on a high calcium and iron content for the diet; the former is necessary since the mammary glands, during their period of activity, are a severe drain on the skeletal lime unless a plentiful supply is present in the food offered for assimilation.

Accordingly such vegetables as celery, asparagus, carrots, lettuce, radishes and spinach, and such fruits as oranges, grape fruit, dates, etc., besides plenty of milk, are necessary in the diet. A liberal amount of iron will be insured by the above list, provided eggs are added. In general the foods will include vegetables easy of digestion, ripe fruits, poultry, beef, lamb, fish, with oysters and the like, eggs, milk, cheese, farinaceous foods (cereals, flour, meals, etc.), breads, especially graham, whole wheat, corn meal, and bran, and simple desserts. Occasionally acid fruits, vegetables, and spices eaten by the mother may cause some disturbance in the baby, and in such cases they should be avoided.

Constipation is to be most carefully avoided, by eating bran bread,[1] vegetables in which the cellulose content is high, and other laxative foods. Drugs should be taken as little as possible, and only on the doctor's advice. Tea and coffee may be taken in moderation, not more than one cup of each a day. Alcoholic drinks of all sorts are better avoided. One quart of milk should be taken each day. Six to eight glasses of good drinking water a day are required, one or two of which should be taken on rising to encourage the action of the bowels.

Exercise. In order that a healthy nursing mother may be able to eat and digest a generous supply of food materials, exercise in the fresh air is indispensable. This must be undertaken gradually, so that the woman who is not accustomed to exercise may not be overtired. A vigorous walk is one of the best of tonics, because of its effect both on the body and on the mind. Worries take flight when treated to sunshine and fresh air and leave the nervous system free to perform its normal functions. The woman who has a garden to look after, or other interests which take her out of doors a good deal in the course of a day, gets her exercise in the most natural way, but she will need to be on guard against overtaxing herself. No exercise should be carried on to the point of weariness, because then the nutriment which should

[1] See "Diet for a nursing mother," Prenatal Care, p. 34.

go to make milk for the baby will be used to renew the mother's worn-out tissues.

Sleep. An abundance of sleep is essential. The nursing mother should have at least eight hours of sleep every night, and an hour in the daytime. A mother soon learns to rest herself whenever the baby nurses, and these brief periods of relaxation help greatly to keep her in good condition.

Bathing.[1] A daily bath is desirable, and should be taken whenever possible. It is especially important to remove the odors of perspiration or old milk from the mother's body and clothing, as the baby may refuse to nurse when an unpleasant odor is forced upon him.

Amusements and Recreation. A conscientious young mother is very apt to defeat her own ends by staying at home too constantly and watching over her baby so incessantly that she grows pale and nervous and begins to worry, a condition which often results in depletion of the milk and corresponding disturbance in the baby. Healthy babies are better off with a judicious amount of "letting alone," and there is no reason why a mother should not be absent some part of every day, if there is a responsible person to be left in charge. Out-of-door life, pleasant recreation which is not exhausting, visiting, and other diversions are essential to every nursing mother if she is to keep up an abundant supply of milk. The family, especially the husband, should realize how important it is to shield the nursing mother from *unnecessary* work and worry, and to provide her at intervals with the opportunity for rest and recreation. However, a healthy mother should not regard herself nor permit her family to regard her as in any sense an invalid at this time. She is much more likely to succeed in nursing if she goes about her ordinary duties as usual and fills her life with normal interests.

TECHNIQUE OF NURSING*

The first secretion of the breasts is called colostrum, and while not a true milk is adapted to the baby's needs in the

1 See "Bathing," Prenatal Care, p. 13.

first hours of his life. He should therefore be put to the breast as soon after birth as the mother is able to bear it. This early nursing is important to the mother because it helps to contract the uterus, and to the baby for various reasons, one of which is that he needs to learn how to draw his food before the breast fills with milk and becomes less pliant and more painful.

The mother holds the baby on her arm, drawing him to the breast in such a way that his head is comfortably supported, turning slightly toward the side she wishes to present and drawing the baby's feet and legs against her body. A pillow under the opposite shoulder is a welcome support. The baby should be able to grasp the nipple squarely. If his head is too low, the milk may flow back in his throat, making him cough and choke; but the head must be low enough so that the nostrils are not covered by the breast. It is impossible for the baby to suck properly unless he can breathe freely, and the mother should hold the breast away from his nostrils with the fingers of her free hand. When the breasts have filled, if the milk flows too fast, as sometimes happens, she may control the flow by taking the breast in her hand so that one finger is above and one below the nipple and by pressing it gently at the base. If the baby's efforts to nurse make the mother's nipples sore, they should be washed with plain boiled water or boric-acid solution before and after each nursing and may be anointed with lanolin at night, covering them with gauze or clean linen. If a crack should appear, the greatest care should be taken to prevent infecting the breast, as if this happens a painful breast abcess may result. A doctor should always be consulted. The cracked nipple should be kept constantly clean by washing it with boiled water. A glass nipple shield should be used, care being taken that it is always perfectly clean and made sterile by boiling. The shield will not materially increase the difficulty of nursing for the baby and will safeguard the mother. If the breasts become engorged, they may be relieved by using a breast pump, if necessary, or by gentle massage; but all manipulation only serves to

stimulate the breast to greater activity and the less handling it can have the better. Hot or cold applications, according to the patient's preference, are useful, and a breast binder is often a great relief, but should be applied by a physician or nurse.[1] Usually the matter rights itself without difficulty as soon as the relation between the supply and demand is established. If the mother has received the proper care during pregnancy and the breasts and nipples have received due attention, which is part of a doctor's duty, the nursing period will be shorn of much of its pain and trouble. In general, the nipples should be kept as clean and as dry as possible and should be washed before each nursing.

REGULARITY IN NURSING*

The baby should be nursed regularly, by the clock, from the very first and should have nothing between meals save water to drink. It takes from one and one-half to three hours for a baby's stomach to empty itself after a full meal of breast milk, and considerably longer for the process of digestion to be completed in the intestines.

The baby should not ordinarily be allowed to remain at the breast over 20 minutes in any case, and the nipple should be withdrawn several times during the nursing, so that he will not take the food too rapidly with consequent regurgitation and indigestion. If the milk is plentiful, the breasts should be nursed alternately, but it may be necessary to give both breasts at one feeding, in order to satisfy the baby. Do not let the baby go to sleep while nursing.

HOW OFTEN TO FEED*

Most babies thrive better if the interval between feedings is fairly long. This interval may be six hours until the milk is established. From that time the baby may be fed at three-hour intervals until he is 4 months old, when four hours should be allowed to elapse between feedings. Many babies do well if fed only once in four hours from birth. However,

[1] See Prenatal Care for the treatment of engorged breasts.

if the breast supply is scanty, more frequent stimulation is sometimes necessary to the success of breast feeding.

Night feeding (after the 10 o'clock nursing) may be omitted when the child is 4 months old.

The following table shows nursing interval and the number of feedings in 24 hours when the three-hour interval is used: [1]

Period	Nursings in 24 hours.	Interval by day.	Night nursings (10 P. M. to 6 A. M.).
		Hours.	
First and second day	4	6	1
Third day to 4 months	7	3	1
4 to 7 months	6	3	0
7 to 12 months	5	4	0

SUPPLEMENTARY FEEDING*

There is apt to be a time, after the departure of the nurse, when the mother is just getting about her accustomed duties and is somewhat enfeebled and worried with the care of the baby, that the supply of milk decreases. It is at this or some other later period of stress that many babies are needlessly weaned. Instead, the baby should be put to breast with unfailing persistence at regular intervals, no matter how little he gets, since every mouthful of breast milk is important to him. It is the tendency of the breasts to cease to secrete milk when suction is discontinued, and it is essential to a continuance of the supply that it be constantly drawn upon. The mother should be encouraged to eat more nourishing food, such as milk, cream, eggs, meat, and good bread, and to take a larger amount of fluid food. Raw eggs beaten up and added to milk agree well with many persons. Even if the amount of milk diminishes until the baby gets little or none, it may often be reestablished by patient and constant effort, provided the mother does not worry, but rather strives in every way to build herself up by good food, out-of-door life, and pleasant surroundings, in all of which she should

1 The Care and Feeding of Children, 1914, L. Emmett Holt, M.D.

have the help of her family. Meanwhile the baby must be given additional food.

WHAT TO FEED*

This supplementary food should be cows' milk, adapted to the age of the infant, given by bottle, using a nipple with a very small hole lest the baby, finding it easier to nurse the bottle, will not suckle the breast with sufficient vigor to give it the required stimulation.

HOW MUCH TO FEED*

In order to determine how much breast milk he is getting, and therefore how much supplementary food is needed, the baby should be weighed, without making any change in the clothing, before and after each nursing in 24 hours and the results carefully set down. At the end of this period it will be possible, by adding the various amounts together, to see exactly how much milk the baby has had and from this to determine to what extent the mother's milk needs to be supplemented. In this situation the help and care of a good doctor are especially needed.

The scales should be similar to grocer's scales, having a pan or basket in which to lay the baby, and should weigh to one-half ounce. Spring scales are not sufficiently accurate for this purpose.

CAPACITY OF BABY'S STOMACH

Newly born	about 1 ounce.
At 1 month	about 2½ ounces.
At 2 months	about 3½ ounces.

from then on, up to the first six months, the gain is only fractional, so that at that time it is barely four ounces.

One should bear in mind that the baby often craves water, rather than milk, and should always be offered it at intervals. It takes in this way one and one-half ounces or more each day, usually at the rate of two teaspoonfuls every four hours. This use of water tends to prevent overfeeding. It is a good

plan to give the water in a nursing bottle, as in this way the child becomes accustomed to its use, and less difficulty is experienced at weaning time, or when breast feeding has to be partially or wholly discontinued for any reason.

WEIGHT*

In order to determine how the baby is thriving, it is necessary to weigh him at stated intervals and compare the results. The average baby weighs about 7 pounds at birth, boys being slightly heavier than girls. A healthy baby may weigh as little as 5 or 6 pounds and as much as 10 or 12 pounds, but these weights are unusual. A slight falling off in weight occurs during the first few days or the first week of life, amounting to a few ounces or as much as a pound, but this loss is promptly regained in from 4 to 10 days, and from that time the baby should show a constant gain in weight. During the first month the daily gain should average about three-fourths of an ounce; at 7 months, about one-half ounce a day; and at 1 year, one-fourth of an ounce a day. The average baby gains about 1¼ pounds a month for the first six months and one pound a month from that time to the end of the first year, doubles its weight at about 5 or 6 months, and trebles it at the end of the first year. A diminishing weight demands careful attention. If there is a loss in weight, and especially if it is accompanied with other symptoms of illness, a good doctor should be consulted at once. If these conditions occur in the heat of summer, the physician will make any change in the diet with very great caution, taking pains not to increase the food to the extent of producing diarrhea.

A very rapid increase in weight is not to be desired. The ideal in baby feeding is not to produce a fat baby, but rather a proportionately nourished one. It is comparatively easy to grow fat, but it is a harder and slower process to grow muscle, bone, blood, and nerve tissue. The majority of mothers feel that if they have a fat, red-cheeked baby it is evidence they are giving the best sort of care, but this is not

always true. Some of the well-advertised infant foods produce just this kind of babies, but the later development shows that the food was deficient in some of the important elements needed for the symmetrical development of all parts of the body, and weakness of some part or some later deficiency of health may be the first indication that such babies were not properly fed. A perfect baby does not have the outlines of his muscles obliterated by wads and cushions of fat. He is alert, springy. The flesh is hard to pressure, not soft and flabby. His color is pinkish, save when the cheeks have been reddened by the cold or heat. A leading English authority on infant care declares that in his opinion "it is practically impossible for any infant to put on more than 6 or 8 ounces of good nitrogenous tissue in one week, and very few can put on as much."[1] Bottle-fed babies should be watched with particular care as to their weight in summer. *It is better to have little or no gain during the excessive heat than to upset the digestion by overfeeding designed to keep the baby gaining.*

HOW TO WEIGH THE BABY*

Undress the baby completely. Put a soft cloth in the pan of the scales, and lay the baby on it; or wrap the baby in a blanket, if the room is not warm. Weigh carefully and write down the result. Remove the baby, weigh the blanket or cloth, and subtract this amount from the first weight.

When weighing the baby before and after nursings to determine the amount of breast milk he is receiving, do not undress him, but weigh both times in exactly the same clothing. If the diaper becomes wet or soiled meantime, do not change it until after the weight has been taken.

ARTIFICIAL FEEDING*

The term "artificial feeding" refers, in common acceptance, to the method of feeding which must be employed when a baby is, for any reason, denied breast milk, because any

1 Eric Pritchard, M.D., Infant Education, London, 1907, p. 18.

other method of feeding a young baby than at its mother's breast is truly artificial.

DIFFERENCE IN COMPOSITION BETWEEN HUMAN AND COW'S MILK

Cow's milk has a larger protein content than human milk, and is richer in mineral matter. Human milk has a larger sugar content and therefore a somewhat sweeter taste. The fat content of the two kinds of milk is about the same, and this is also true of the total solids. The following table shows the average composition of the two kinds of milk:

	Human	Cow's
Water	87%	87%
Total solids	13%	13%
Fatty matter	4%	4%
Lactose	7%	5%
Protein (see second table)	1.5%	3.3%
Mineral matter	0.2%	0.7%

The fat of cow's milk differs with the breed of milch cow, and may be as low as 2 per cent. or 3 per cent. The fat in human milk is quite constant in amount, but the protein content may vary from 1 per cent. to 2 per cent., the 1.5 per cent. in the table being an average.

Human milk, in comparison with cow's milk, is very poor in casein, but rich in lactalbumin and hence, when coagulated, does not form large curds like cow's milk. The relations between casein and lactalbumin in the two kinds of milk are shown in the following table:

	Human	Cow's
Total protein	1.50	3.30
Casein	.50	3.00
Lactalbumin	1.00	.50

The high protein content and large proportion of casein in cow's milk are advantageous to the calf, with its rapid rate of growth, and complex system of stomachs in which large curds can be completely digested; but for the more slowly growing baby, whose digestion is largely intestinal,

the proportion of protein and the character of the curd must be modified. The fat of mother's milk contains more olein and more phosphorized fat (lecithin) than cow's milk. The lactose is chemically the same. Freshly drawn cow's milk is neutral or amphoteric in reaction to litmus. Basic elements predominate in both cow's and human milk, and hence they are both technically alkaline. The acidity of cow's milk to certain indicators is due to the presence of acid salts, such as acid calcium phosphate.

On standing, true acid is formed by the action of lactic acid bacteria upon the lactose. For this reason, cow's milk frequently reacts acid to litmus. Breast milk is practically sterile.

MILK*

Wide experience has shown that fresh cows' milk is the best substitute for breast milk. This milk should be the purest and cleanest possible; it should be the product of a tuberculin-tested herd, one that is healthy, well fed, properly housed and cared for, and milked by clean milkers into sterilized utensils. The milk should be bottled and cooled at the dairy and delivered to the consumer in sealed bottles. The milk commonly sold from open cans, known as "loose" or "dipped" milk, should never be given to a baby.

Certified Milk. In certain places it is possible to obtain what is known as "certified" milk, which is fresh, clean, pure, normal milk of uniform composition and highest quality obtained from healthy cows and produced and handled under the supervision of a medical milk commission, with special sanitary precautions. Although the amount of certified milk is as yet far too small, the demand for it is steadily increasing. As soon as mothers become convinced of the infinite advantage of having a supply of raw milk whose quality is guaranteed, they are quite ready to pay the additional cost. This milk averages to cost about 16 cents a quart; but compared with the cost of the illness due to the use of unclean milk, this is not to be considered. There can be no doubt that the

use of certified milk has been a great factor in the reduction of deaths from infantile diarrhea in recent years. The American Association of Milk Commissions publishes literature on the subject. The secretary may be addressed at the Ortz Building, Cincinnati, Ohio.

Heating or Cooking Milk. When certified milk can not be had, or some other milk known to be clean, it is safer to heat that which is used. Bad milk may look clean and may taste and smell sweet, since disease germs do not reveal their presence by the ordinary tests. It is very difficult to insure the cleanliness of the general milk supply, and since it seems impossible to be certain that the milk is always perfectly clean, it is necessary to kill these germs by some process of heating before using the milk for young babies, or for any babies, in the heat of summer. These processes, however, do not make good milk out of bad, nor clean milk out of that which is dirty; they merely make a poor thing a little less dangerous, and emphasize the necessity for raising the standard of local milk production.

Breed of Cows. Authorities recommend the herd milk of Holstein or ordinary grade cows for infant feeding, as such milk has a more nearly proper percentage of fat than others. If one is obliged to use milk having a high percentage of fat, such as that from Jersey or Guernsey cows, some part of the fat should be removed before making up the feedings.[1]

Care of the Milk. One of the reasons why cows' milk is not always a safe food is that it is very readily infected with germs, some of which may make the baby sick. These germs multiply with astonishing rapidity when the milk is allowed to stand for any length of time at a moderate temperature, but do not flourish if the milk is kept very cold. The milk should never be left standing on the doorstep in the sun, nor in a warm kitchen, but should be put in the ice box as soon as it is delivered. It must be kept covered, protected from dust and flies, not left standing in shallow, open pans nor put

[1] Milk and its Relation to the Public Health, Hygienic Laboratory Bull. No. 56. Wash. D. C.

into the refrigerator in pitchers or open dishes, as it is very readily contaminated by other foods. Milk should be kept in glass jars or bottles which are made sterile by boiling before being filled. If the milk is sour, or shows a sediment in the bottom of the bottle, it is not fit to give to the baby.

A Homemade Ice Box. An ice box to keep the baby's feedings cold for 24 hours, can be made at home for very small cost, as follows: Procure a wooden box about 18 inches square, the same depth; put a layer of sawdust 3 inches thick in the bottom of the box; fill in with sawdust around a 10-quart tin pail or a section of 10-inch galvanized pipe which occupies the middle of the box. Inside this pail or pipe place another slightly smaller pail, which is to hold the ice and the bottles. This inner pail should be covered, and the outer box tightly closed by a wooden cover lined with several thicknesses of newspaper. The inner pail should be taken out each morning to be emptied and cleaned. This little device will keep cool with 5 cents' worth of ice for 24 hours or even longer. When feeding time comes, the box is opened, one bottle is taken out, and the box is quickly closed again.

HOW TO FEED THE BABY

WHAT TO FEED*

Leading authorities differ so widely on various points connected with this subject that no directions can be given which will meet with general agreement. A few of the fundamental points are given here, but whenever possible the mother should confer with a good doctor regarding an artificially fed infant.

The only proper artificial food is cows' milk, suitably modified to suit the child's age and development. Some babies have peculiarities, and with them rules can not be closely followed; but with most, if proper rules are followed from the outset, there will be comparatively little trouble. The advice of a good doctor should be sought and followed. It is most unwise for the mother to experiment with different foods or different mixtures, or to try to feed her baby by the advice of her neighbors.

GENERAL PRINCIPLES OF MILK MODIFICATIONS

It must be constantly borne in mind that anything but mother's milk is a foreign substance in the stomach of the child, and even to make a mixture agreeing in chemical composition with the natural food is not to insure success. The general principles must be applied in a special way to each individual case.

The first step in modification is the dilution of the protein. Few new-born infants can digest pure cow's milk. Some require more dilution than others. Where the digestive powers are unknown, it is wise to begin with a low strength and advance as rapidly as the condition of the child will permit. From ¼ to 1 per cent. protein is commonly recommended for the early weeks.

The second step is the adjustment of the fat. Individual infants differ in their tolerance of fat as of protein. But inasmuch as the chemical and physical differences are not as great in the case of fat, it is usually not necessary to reduce it below 2 per cent., and it should approximate the proportion in mother's milk as rapidly as possible.

When whole milk is diluted, if more than one volume of water be added, the percentage of fat is less than two, and for greater fat content, fat must be added in the form of cream. Since it is difficult to get the right percentage in this way, it is customary to select a milk with such a ratio between the protein and fat that diluting one to the desired strength dilutes the other also to the required degree and is known as the Top Milk Method. This is accomplished by taking the upper layers of milk which has been standing five hours or more for the cream to rise. The upper layers have much fat and little protein; the lower, much protein and little fat, and the adjustment is readily made by taking a certain number of ounces for dilution. In the laboratory, the exact fat and protein content can be determined by direct analysis.

The third step in modification is the adjustment of the

milk sugar. This can usually be given of the full strength found in mother's milk (7 per cent.). Since lactose commercially prepared from cow's milk is of the same composition as that in mother's milk, it is only necessary to know the percentage already present in the mixture to be fed, and then add sufficient to make the desired strength.

Besides these three main steps in artificial feeding, we may have as a further consideration the selection of a diluent. Water is the first choice, but to aid in the modification of the character of the curd, cereal waters or gruels, lime water, proprietary foods, etc., are sometimes prescribed. Carefully prepared, and regarded mainly as dilutents and not as substitutes for milk, the cereals and prepared foods are often useful aids. Lime water causes the mucin of the milk to swell, and tends to send the curd in soft condition into the intestines. It is also beneficial as a corrective of constipation.

THE CHARACTER OF THE MILK MAY BE ALTERED, CHEMICALLY

1. It may be predigested, in which case there is no casein to curdle.

"Peptonisation" is accomplished by the use of commercial trypsin (pancreatic extract, and sodium bicarbonate). Put the mixture into milk at body temperature 32° C. Heat for approximately two hours, and arrest the process at the partial peptonisation stage since peptonised milk is bitter. This modification relieves the stomach of practically all its work, but should be made use of for short periods only.

2. Sodium bicarbonate can be used. Sodium citrate is available for the same purpose. Milk of magnesia also changes the acidity of the stomach.

3. "Protein milk" for emergency cases, is made in the following way: A quart of fresh milk is curdled with rennet, using one junket tablet for the quart. Keep the milk at body temperature for half an hour; then filter through cheese cloth, and discard the whey. Mix the curd with a pint of

water; beat, and rub through a very fine sieve two or three times. Finally add a pint of buttermilk. This preparation has a fuel value of 350 calories to the quart, and the percentage composition is as follows:

Protein, 3%. Fat, 2½%. Carbohydrate, 1½%. Ash, ½%.

WHAT DILUTION TO USE

The degree of dilution varies with the age of the child. Advance is made from low strength to higher as rapidly as the child is able to digest stronger food. Since it is usually necessary to begin with a formula weaker than mother's milk, it is desirable that stronger formulæ be given as soon as practicable to compensate for this early loss. This is particularly true as regards mineral constituents. On diluted cow's milk, the child gets less iron and phosphorus than in mother's milk, and while cow's milk is rich in calcium, it is doubtful whether this is as perfectly utilized as that in human milk.

Whenever there are signs of indigestion, such as vomiting or frequent loose stools, the mother should dilute the food, or omit it altogether, giving nothing but a little plain boiled water until the doctor sees the baby.

MODIFIED WHOLE MILK

The following directions for feeding the baby modified whole milk have been prepared by a committee of the American Medical Association.[1]

Beginning on the third day, the average baby should be given 3 ounces of milk daily, diluted with 7 ounces of water. To this should be added 1 tablespoonful of lime water and 2 level teaspoonfuls of sugar. This should be given in seven feedings.

At 1 week the average child requires 5 ounces of milk daily, which should be diluted with 10 ounces of water. To this should be added 1½ even tablespoonfuls of sugar and 1 ounce of lime water. This

[1] "Save the Babies," prepared for use in Baby Health Conferences for the Committee on Public Health Education Among Women, by Drs. L. Emmett Holt and Henry L. K. Shaw. Council on Health and Public Instruction, American Medical Association.

should be given in seven feedings. The milk should be increased by one-half ounce about every four days. The water should be increased by one-half ounce every eight days.

At 3 months the average child requires 16 ounces of milk daily, which should be diluted with 16 ounces of water. To this should be added 3 tablespoonfuls of sugar and 2 ounces of lime water. This should be given in six feedings. The milk should be increased by one-half ounce every six days. The water should be reduced by one-half ounce about every two weeks.

At 6 months the average child requires 24 ounces of milk daily, which should be diluted with 12 ounces of water. To this should be added 2 ounces of lime water and 3 even tablespoonfuls of sugar. This should be given in five feedings. The amount of milk should be increased by one-half ounce every week. The milk should be increased only if the child is hungry and digesting his food well. It should not be increased unless he is hungry, nor if he is suffering from indigestion even though he seems hungry.

At 9 months the average child requires 30 ounces of milk daily, which should be diluted with 10 ounces of water. To this should be added 2 even tablespoonfuls of sugar and 2 ounces of lime water. This should be given in five feedings. The sugar added may be milk sugar or if this cannot be obtained cane (granulated) sugar or maltose (malt sugar). At first plain water should be used to dilute the milk.

At 3 months, sometimes earlier, a weak barley water may be used in the place of plain water; it is made of one-half level tablespoonful of barley flour to 16 ounces of water and cooked for 20 minutes.

At 6 months the barley flour may be increased to 1½ even tablespoonfuls cooked in the 12 ounces of water.

At 9 months the barley flour may be increased to 3 level tablespoonfuls cooked in the 8 ounces of water.

Sugar is added to the food not to sweeten it but to furnish a necessary foodstuff. Ordinarily it is much better to avoid using it. Physicians differ as to the best sugar for use in infant feeding. Malt sugar gives very good results, and several preparations which contain dextrin as well as maltose are on the market, but are expensive. Milk sugar is also expensive, and some physicians believe that it has a greater tendency to upset the baby. Cane sugar is the cheapest form of sugar, and many babies seem to digest it very well. One objection to the use of cane sugar is that the baby quickly becomes accustomed to the sweet taste, making it difficult later to induce him to eat unsweetened foods.

TOP MILK METHOD IN INFANT FEEDING

L. Emmett Holt[1]

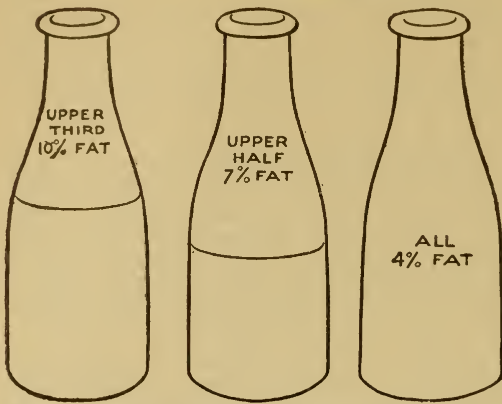


Fig. 1. The percentage of fat in different layers of milk.

Fig. 2. Chapin's dipper for removing the upper layers of milk.

The top milk method has been greatly simplified by Dr. Holt and the following suggestions will be helpful in applying it:

"Milk bottled at dairies should be allowed to stand after it is received for at least two hours before removing the top-milk. This may be done with a siphon, spoon or small, special dipper; pouring off is not accurate.

It is unnecessary in practice to have a top-milk which contains more than 7 per cent. fat; while it is desirable at times to obtain milk which is practically fat-free. It is also desirable to know the percentage of fat that is obtained when one uses various quantities from the top or bottom of a quart of milk. These values are only approximate, but if the top-milk is carefully removed, are sufficiently accurate for practical purposes. These may be obtained from average herd milk or very rich milk as given on page 444 (from 4% and 5% milk).

1 Holt and Howland: "Diseases of Infancy and Childhood." D. Appleton & Co., New York, 1916.

FORMULAS FROM WHOLE (4 PER CENT) MILK GIVING APPROXIMATE PERCENTAGE COMPOSITION AND CALORIC VALUE

Dr. L. Emmett Holt

TABLE 1

Number of formula	I	II	III	IV	V	VI	VII	VIII	IX	X
Milk (ounces) ...	6	7	8	9	10	11	12	13	14	15
Water (ounces) ..	14	13	12	11	10	9	7	5	1	0
[1] Gruel (ounces) .	...	...	...	...	...	...	1	2	5	5
Sugar of milk ... (Even tablespoons)	2½	2½	2½	2½	2½	2½	2	1½	1	1
Total	20	20	20	20	20	20	20	20	20	20
Fat, per cent.	1.20	1.40	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00
Sugar, per cent. .	5.70	6.00	6.00	6.50	6.50	6.50	6.00	5.50	5.50	5.00
Starch, per cent. .	...	...	...	...	...	...	.40	.80	2.00	2.00
Protein, per cent.	1.00	1.20	1.40	1.60	1.75	1.90	2.10	2.25	2.40	2.60
Calories per ounce	11.5	12.5	13.5	14.5	15.5	16.5	17	18	20	21
Age (approximate)	2 days	1 week	3 weeks	2 months	3 months	4 months	5 months	6 months	8 months	9–11 months

[1] 1 oz. cereal to 10 oz. water by volume.

From 1 quart 4% milk		*From 1 quart 5% milk*
Upper 16 oz. has	7% fat	Upper 20 oz.
" 20 " "	6% "	" 24 "
" 24 " "	5% "	all the milk
All the milk "	4% "	Rest after removing top 2 oz.
Rest after removing top 2 oz. has	3% "	" " " " 3 oz.
" after removing top 4 oz. has	2% "	" " " " 5 oz.
" after removing top 8 oz. has	1% "	" " " " 8 oz.

Fat-free milk can be obtained only by the removal of the cream by a separator.

FORMULAS FROM WHOLE (4 PER CENT) MILK

Giving Approximate Percentage Composition and Caloric Value Per Ounce

Dr. L. Emmett Holt

Two formulas are used of which the second differs from the first in having a larger fat percentage. The first formula is given in full. Note table I Page 443.

The second formula is sometimes substituted for the first, after the first few weeks. The upper half of a quart bottle of milk, i.e. a 7 per cent. top-milk is substituted for whole milk. The child receives from a third to a fourth less milk than in the first formula. The second formula may be used up to the seventh or eighth month, when the child returns to whole milk with gruel addition. The second formula may be used by any child who can assimulate the increased fat percentage. The top-milk formula should never be used for children with weak digestion.

TOP MILK MODIFICATION

The following table from Dr. Holt's book shows the amount of food required by the average healthy baby at the given ages and the proper interval between feedings:

TABLE II

Schedule for Feeding Healthy Infants During the First Year

Age	Interval (hours)	Nights (number) (after 6 P.M.)	24 hours number	Amount 1 feeding oz.	Amount 24 hours oz.
2d to 7th day	3	2	7	1–2	7–14
2d, 3d and 4th weeks	3	2	7	2½–4½	18–32
2d and 3d months	3	2	7	3½–5	24–35
4th and 5th months ...	3	1	6	5–6	30–36
6th, 7th, and 8th months	4	1	5	6½–7½	32½–37½
9th and 10th months ..	4	1	5	7–8	35–40
11th and 12th months ..	4	1	5	8–9	40–45

The interval is reckoned from the beginning of one feeding to the beginning of the next. Large children with strong digestion may take the larger quantities, while small or weak infants should take the smaller amounts. If the baby either habitually regurgitates his food or leaves some milk in the bottle each time, the interval between feedings should be increased.

SIMPLE METHOD OF CALCULATING A MILK FORMULA ON A BASIS OF CALORIC REQUIREMENTS

Dr. L. Emmett Holt

This is based on the experience that a child requires 1½ oz. milk for each pound of body-weight. An infant weighing 10 pounds therefore requires 15 oz. of milk in 24 hours. Its caloric requirements are 45 to the pound or 450 for a 10 lb. child. The milk alone supplies 20 calories per oz. or 300 in all. To secure the additional 150 fat, sugar or starch must be added. One ounce of sugar gives 120 calories; 1¼ oz. gives 150. The amount of diluent (water, etc.) to be added is calculated from the liquid requirement which is 3 oz. per

pound for the early and 2 oz. for the later months. Thus if a 10 lb. child requires 30 oz. of fluid daily, 15 oz. of water will have to be added to the 15 oz. of milk.

The formula will therefore be as follows for a 10 lb. child:

Milk	15 oz.	300 calories
Sugar	1¼ oz.	150 "
Water	15 oz.	...
Total	30 oz.	450 calories

The 30 ounces should be taken in 7 feedings of 4¼ oz. each or in 6 feedings of 5 oz. each.

TABLE III

Calorie Requirements

1 month 400	7	feedings	4½	oz.	Table	1	Formula	III
2 months 500	7	"	4¾	"	"	"	"	IV
3 " 560	7	"	5	"	"	"	"	V
6 " 640	5	"	7½	"	"	"	"	VIII
9 " 740	5	"	7¾	"	"	"	"	IX

PREPARATION OF THE FOOD*

Home Modification

Everything that is to be used in the preparation of the baby's food, including the hands and clothing of the mother or nurse, must be absolutely clean. To clean the utensils they should be boiled in the large kettle for 15 minutes just before using.

Utensils. Enameled ware or aluminum utensils are the safest kind to use, since they are most readily kept clean. They should be used exclusively for this purpose. The following articles will be found convenient:

As many nursing bottles as there are feedings in one day.
A nipple for each bottle.
A new clean cork stopper for each bottle.
A bottle brush.
A graduated measuring glass.
A 2-quart pitcher.
A funnel.

A long-handled spoon for stirring the food.

A pail or kettle for pasteurizing the milk and sterilizing the utensils.

A fork.

A tablespoon.

A double boiler for cooking cereals.

A clinical thermometer.

A bath thermometer. The frame being wood, which permits the thermometer to float.

A milk thermometer.

Bottles. The best nursing bottle is the one which affords the least harbor for germs. An 8-ounce cylindrical bottle having the scale in ounces blown in the side is most convenient, as it fits readily into the ice box and the pasteurizer. Nursing bottles with a neck are difficult to clean and require a brush, which must also be kept clean. If the neck is short, sloping gradually into the shoulder the construction is better than bottles with long necks, or abrupt shoulder. Nursing bottles have influence on baby mortality; therefore, mothers should use the nursing bottle which is safest for the baby.

CARE OF BOTTLES *

New bottles should be annealed by placing them on the stove in a dishpan of cold water and leaving them to boil for 20 minutes. Allow them to stay in the water until it is cold. Bottles thus treated will not readily break when filled with boiling water or when the food is being cooked in them.

Each bottle should be emptied as soon as the baby has finished nursing, then rinsed with cold water and left standing, filled with water, until the bottles for one day's feedings have all been used. At a convenient time, scrub all the bottles with hot soapsuds, using the bottle brush over every part of the inside. Then rinse them thoroughly through several waters and put them in a kettle of water over the fire. When the water has boiled for 15 minutes the bottles will be sterilized.

Nipples. A conical nipple is best, since it can be readily

turned inside out to be cleaned. Nipples attached to long rubber tubes should never be used, as it is impossible to clean them. They are so dangerous to infant health and life that the sale of them ought to be prohibited by law. The hole in the nipple should be just large enough so that when the filled bottle is held upside down the milk drops rapidly. If the hole is large enough so that the milk runs in a stream, the baby will take his food too fast.

Care of Nipples. Nipples need special care. If allowed to soak in water when not in use the rubber quickly becomes spongy and disintegrates, the hole grows larger and larger, and the nipple is soon unfit for use.

Immediately after the feeding remove the nipple and rinse with cold or warm (not hot) water. Rub the outside with a little common salt to remove the milk, turn the nipple inside out, rinse, and rub with salt; rinse again and boil for five minutes. The nipple will dry at once when removed from the boiling water. Place in a dry glass jar which has been boiled and screw the cover on tight. Keep from the light. The nipples should be rinsed in boiled water just before using.

It is wise always to have extra nipples prepared, as they are subject to many accidents.

How to Prepare the Feedings. Take the milk bottle out of the ice box, rinse with boiled water, and wipe the top with a clean towel. Next remove the paper cap with the fork which has just been boiled. Then pour out enough milk for the day's feedings, measuring the amount in the glass graduate, and empty it into the pitcher. Measure the required amount of water (using cold boiled water) in the same way and add to the milk. Measure the sugar and lime water; add these to the milk and water and stir well. Then take as many bottles as there are to be feedings in 24 hours, and fill them exactly to the proper depth according to the scale blown in the bottle. If the materials have been carefully measured, the bottles will be filled to equal depth. Close with new, clean bottle corks in preference to wads of cotton, and pas-

teurize or sterilize the feedings thus prepared in accordance with directions that follow.

Pasteurizing. This process consists in heating the milk to 145 degrees, holding it there for some time (20 to 30 minutes), and then cooling it rapidly to 50 degrees. The use of one of the excellent pasteurizers and sterilizers in the market greatly simplifies this part of the work, but satisfactory results can be attained by the use of an ordinary pail or kettle. A convenient method for home pasteurizing is as follows:

Put a gallon (4 quarts) of water on the stove in a kettle. When the water is boiling hard, remove the kettle from the stove to a table and allow it to stand uncovered for 10 minutes; then put the filled and loosely corked bottles into the water, cover the kettle, and allow it to stand covered for half an hour. At the end of this time remove the bottles, cool rapidly under running water, and put in the ice box until needed. Do not uncork the bottle from the time it is first closed until the baby is to be fed.

Boiling. Fill the bottles and stand them in a kettle of water over the fire. When the water has boiled three-quarters of an hour the milk will have been sufficiently heated; or, when more convenient, the milk may be simply boiled in a clean saucepan for three minutes, poured into sterilized bottles, and then cooled rapidly in running water.

NOTE: It is well to put a wooden rack at the bottom of the receptacle in which nursing bottles are placed. This will protect the bottles from contact with the iron receptacle, or tin, whatever is used, and prevent breakage.

HOW TO GIVE THE BABY THE BOTTLE *

When it is time to feed the baby take the cold bottle from the ice; do not pour out the milk, but place the bottle, still corked, in a vessel of warm water, having the water cover the bottle above the milk line, and allow the water to heat. Do not allow the water to boil, as that will make the milk

too hot. To test the temperature of the milk, open the bottle and drop a little milk on the inner surface of the arm. If it feels comfortably warm to the mother's skin it will be right for the baby. If it has been made too hot, cool the bottle under running water. The mother should never put the nipple in her own mouth to test the temperature of the milk, as an infection, such as a "cold," might easily be conveyed in this way from mother to baby. Put on one of the sterile nipples from the jar. Handle the nipple only by the neck, and do not touch the part which is to go into the baby's mouth.

Hold the baby on the left arm in the same position as for breast feeding. The bottle should be held by the mother or nurse throughout the feeding. It must be presented to the baby at such an angle that the neck of the bottle is kept continually filled and the baby is able to grasp the nipple squarely. The feeding should be finished in 20 minutes. If the baby eats greedily, withdraw the nipple for a moment several times during the feeding. If he is sleepy, keep him awake until the bottle is finished. If, in spite of this, he falls asleep, remove the bottle and do not give another until the next feeding time. Babies like to nurse a little, then sleep a little, then take the bottle again; but this should not be allowed, as it unduly prolongs the feeding.

NORMAL FEEDING *

If the baby has been breast fed for a while and is then put on cows' milk, it is wise, until he has become somewhat accustomed to the new food, to use a weaker mixture at first than the one indicated for that age. The food can be strengthened every few days if necessary until it suits his age. If the baby shows any signs of disturbed digestion it is wise to return at once to the weaker food until he is quite well again; if he seems satisfied, is gaining from 4 to 6 ounces a week, does not vomit, and has normal stools, it is reasonably certain that the food is of the right strength and quantity.

UNDERFEEDING *

As a rule, babies are overfed rather than underfed. But if the baby cries as soon as the bottle is taken away, and again before the next feeding time, a careful increase may be made day by day toward a stronger mixture, stopping at a point where he is satisfied.

OVERFEEDING *

If the baby sleeps restlessly, vomits his food, or has loose bowel movements, it usually indicates that he is being fed too much, too often, or that his food is stronger than he can digest. If the baby is breast fed, the interval between nursings should be lengthened to 4 hours, as a first measure. It is wise to see the doctor, when possible. For bottle-fed babies the amount of the day's feeding may be decreased by using one-half of the usual contents of each bottle until the disturbance has subsided.

DRINKING WATER *

The baby needs plenty of cool, unsweetened water to drink. It is safe to boil all the drinking water for a baby, which should be given to a young baby lukewarm, never ice cold. Never put sugar or anything else in it. Offer it to the baby between feedings; in summer especially he needs to drink frequently. A "runabout" baby is constantly exercising while awake and requires a great deal of water. Fretful babies, especially those who are cutting teeth, are often quieted by a cool drink.

FEEDING OF OLDER INFANTS

Some general rules:

1. Unless a child has loose bowels, he should be given from 1 to 3 tablespoonfuls of orange juice once a day after he is about 5 or 6 months old. Up to the time he doubles his weight, he has enough iron stored in his body for his needs, but after that he needs iron-bearing food.

2. Do *not* feed him beef juice, beef tea, or broths. The

first two particularly, are too high in flavor, and tend to putrefaction in the large intestine.

3. After the twelfth month there is no advantage in continuing mother's milk which by that time has deteriorated. Artificial food should be gradually substituted, and a single meal fed from time to time from the bottle. A baby 9 months old may at first have to try a formula of cow's milk made for a child 6 months old who has been fed artificially from the first; and even a more dilute mixture may be necessary for a while.

4. The transition period comes between the tenth and fourteenth month. Milk is still the chief food during the second year, but the baby must have in addition, iron from the yolk of egg, and from orange juice or prune pulp: he must also have food for developing chewing muscles and teeth, such as stale bread, toasted, and zwieback. He may also have thoroughly cooked, strained cereal, preferably oatmeal. Other solid food should not be given during the second year.

5. Feedings must be regular: the digestive tract responds to good eating habits.

Good hours for meals are:

First feeding	6.30– 7	A. M.
Mid-morning feeding	9.30–10	A. M.
Noon feeding	11.30–12	A. M.
Afternoon feeding	2.30– 3	P. M.
Evening feeding	5 – 5.30	P. M.
Bed at six o'clock.		

6. During the third year milk is still one of the most important of the child's foods, and a quart should be allowed. Cereals need no longer be strained, if thoroughly cooked; the whole egg may be given, although the yolk is still the more valuable part; stale bread is still used, but crackers — graham or Uneedas — may be substituted in certain meals. Fruit juice, and dried fruits including raisins, dates, and figs are valuable, as are green vegetables, such as spinach, peas, and carrots. Baked potato may also be given.

7. In the fourth year, vegetables and fruits need not be strained, and cream may be added to the vegetables. Cabbage, cauliflower, and lettuce must not be given, nor should *any meat* be fed at this age. It is not desirable to give it until the child is 7 or 8 years old.

8. Never give the baby or young child, cakes, candy, doughnuts, pastry, fresh breads, griddlecakes, sirups or molasses, pork or meat of any kind, bananas or any overripe fruit, pickles, tea, coffee, soda water, wine, cider, beer, nor tastes of the family meals. If this is begun, he will soon demand a taste of everything he sees, and his appetite for the simple diet which is essential at this age will be quickly destroyed.

WEANING *

Weaning is the process whereby the baby is gradually deprived of breast milk. It should proceed slowly, one-bottle feeding being substituted for one breast feeding during the day for some time, then two bottles, and so on until all breast feeding has been done away with and the baby is entirely weaned. In order that this change may be accomplished with as little disturbance as possible, one bottle feeding may be given to the baby in 24 hours as early as the fifth or sixth month. This will hardly be sufficient to upset the baby's digestion and yet will serve to accustom him to the taste of strange food and to the use of the bottle and to begin the education of the stomach in dealing with new materials.

When to Wean. In most cases the baby should be weaned by the end of the first year, and in some cases from one to three months earlier, depending largely upon the health of the baby, the amount and quality of the breast milk, and upon the time of the year. It is unwise to wean the baby in the heat of summer or when infant illness of any sort is epidemic. It has been proved over and over again that breast milk will save a sick baby's life and restore him to health after the strain of a long hot summer, and that often there is no other food that can be relied upon to accomplish the same result.

Therefore, even though the breast milk must be supplemented with one or several bottles, it is wise to nurse the baby through the summer so that the breasts will not cease entirely to secrete and may be called on in an emergency. If the baby is weaned at 10 months or earlier he may be fed by bottle; if not until the end of the year, he may be taught to drink from a glass or cup directly.

If drinking water has been given by means of a nursing bottle during much of the first year, the baby will take his food in the same way the more readily. A healthy infant weaned at 9 months should begin with the food for an infant of 4 or 5 months. If he digests this mixture well, the strength can be increased until within two or three weeks he is taking the food full strength. Increase in the diet should be made with special caution at the beginning of summer or during the heat, when there is great danger of inducing diarrhea. *It is far better to keep the baby on rather a low diet, even without increasing his weight, than to upset the intestinal tract by overfeeding.* If, after trying a new food, vomiting occurs or the stools show that there is indigestion, it is always best to return to the weaker food until the disturbance has subsided.

Weaning from the Bottle. An artificially fed infant is weaned from the bottle by beginning at 10 months to substitute one feeding a day from the spoon or cup for one bottle feeding, gradually increasing the number of such feedings until the baby is weaned, usually by the thirteenth month. The mother will find it a convenience to continue the bottle for the night feedings as long as necessary.

CHAPTER XXII

THE FEEDING OF YOUNG CHILDREN

Whether the child be fed at the breast or with the bottle, the period from the tenth to the fifteenth month is usually one of transition. For the breast-fed baby it may be more critical than for the artificially fed; but the former should ordinarily have been growing used to a certain proportion of cow's milk in his diet. By the fifth or sixth month iron-bearing foods such as yolk of egg and orange juice should be added to the diet. The white of egg may be used if the baby cannot take milk. By the ninth month thoroughly cooked gruel may be added to the milk diet.

Throughout the growing period the child should have at least a quart of milk a day. When he is a year old, he may have, in addition to the milk, strained cereals, stale bread, toast or zweiback, soft-cooked egg (especially the yolk), fruit juice or fruit pulp, such as orange juice and prune pulp. Such a diet should continue well through the second year. By the end of that time well-cooked, strained or finely mashed vegetables, such as baked potato, spinach, carrots, and peas, may be added. It is no longer necessary to strain the cereals if they are thoroughly cooked. Stale bread is still given, but crackers such as graham and Uneedas may be substituted in certain meals. Fruits should be given daily, and raisins, dates, and figs are valuable additions to those already named. If a distaste for milk arises, the variety of other foods should be cut down, and every effort made to lead the child back to it. In fact there should be little variety up to the fifth year. During the fourth year it is unnecessary to strain vegetables and fruits. Cream may be

added to the vegetables. Meat is very undesirable for young children, and should not be given until about the seventh year, since protein is obtainable in more easily digested forms from milk and eggs. Sweet fruits, such as prunes, dates, and figs, are much better than pure sugar, since they contain valuable mineral constituents, and are less likely to destroy the taste for other proper food.

Tea, coffee, beer, and even cocoa except occasionally and very weak, should be prohibited. The child should no more expect to eat the same food as an adult than to dress like one. But his diet should be limited in quality rather than quantity, as he requires much more in proportion than an adult on account of his requirements for growth and his great activity. Up to five years of age, about eighty calories per kilogram seems to be desirable.

A well-known dispensary sends out printed instructions for the people of its neighborhood, prohibiting all eating between meals, and forbidding all pastry, coffee, tea, alcoholics and carbonated drinks, in the case of children of any age.

Those under seven years of age are allowed no meats nor fish, no hot bread, griddlecakes, or nuts, no corn, cucumbers, egg plant, nor cabbage.

For those under four years no stews, tomatoes, bananas, and fruit sparingly in hot weather.

Children up to the age of eighteen months are to be limited entirely to milk, orange juice, and cooked and strained cereals; with, in exceptional cases, zwieback, biscuit and soft-cooked eggs.

Such education means much for the development of hardy men and women. Undernutrition is not due alone to poverty; much of it comes from ignorance.

GENERAL RULES FOR FEEDING YOUNG CHILDREN

Thompson [1]

1. Allow time for meals.
2. See that the food is thoroughly masticated.

[1] W. Gilman Thompson, M.D.: "Practical Dietetics." New York. D. Appleton & Co.

3. Do no allow nibbling between meals.
4. Do not tempt the child with the sight of rich and indigestible food.
5. Do not force the child to eat against his will, but examine the mouth, which may be sore from erupting teeth; and examine the food, which may not be properly cooked or flavored. If good food is refused from peevishness merely, remove it and do not offer it again before the next time.
6. In acute illness reduce and dilute the food at once.

Table of Comparisons, Food Required by Child and Man

A child under 2 requires 0.3 the food of a man doing moderate work.

A child of 3 to 5 requires 0.4 the food of a man doing moderate work.

A child of 6 to 9 requires 0.5 the food of a man doing moderate work.

A child of 10 to 13 requires 0.6 the food of a man doing moderate work.

A girl of 14 to 16 requires 0.7 the food of a man doing moderate work.

A boy of 14 to 16 requires 0.8 the food of a man doing moderate work.

PROF. W. O. ATWATER.

Table Showing Increase of Calories Required for a Growing Child

AGE. years.	PROTEIN. grammes.	FAT. grammes.	CARBO-HYDRATES. grammes.	CALORIES.
1½	42.5	35.0	100	909.7
2	45.5	36.0	110	972.4
3	50.0	38.0	120	1050.4
4	53.0	41.5	135	1156.8
5	56.0	43.0	145	1224.0
8 to 9	60.0	44.0	150	1270.0
12 to 13	72.0	47.0	245	1736.8
14 to 15	79.0	48.0	270	1877.3

HUTCHISON, p. 453. SCHROEDER, *Archiv. für Hygiene*, iv. 39, 1886.

DIETARIES FOR YOUNG CHILDREN

Diet for the second year.—900–1200 Calories per day:

7 A. M. Orange juice, 2 tablespoonfuls (1 ounce).
Cereal—oatmeal strained, 4–5 tablespoonfuls.

Bread toasted, one thin slice.
Milk, 1 cup (for cereal and to drink).

9:30–10 A. M. Milk, ½ cup.
Zweiback, 3 pieces.

11:30–12 M. Bread, stale, 1 slice.
Yolk of egg (cooked soft and mixed with bread crumbs).
Milk, 1 cup.

2:30–3 P. M. Orange juice, 2 tablespoonfuls.
Zweiback, 2 pieces.

5–5:30 P. M. Bread toasted and dipped in milk, 2 thin slices.
Milk, 1½ cups.

Diet for third year.— 1300 Calories (at least) per day.

7 A. M. Cream of Wheat, with 2–3 dates, 5–6 tablespoonfuls.
Bread toasted, one slice, with
Egg, soft-cooked.
Milk, 1 cup.

9:30–10 A. M. Graham crackers, 4 (small).
Milk, ½ cup.

11:30–12 M. Potato, baked and mashed.
Peas, carrots, with cream added.
Bread, 1 thin slice.
Milk, ½ cup.

2:30–3 P. M. Uneeda Biscuits, 2.
Milk, ⅔ cup.
Fig, 1.

5:30–6 P. M. Bread, 2 slices toasted.
Milk, 1 cup.

Diet for fourth to seventh years.— 1400–1800 Calories per day.

Breakfast.— Every day:

A mild fruit: as orange, fresh ripe or baked apple, stewed prunes.

A well-cooked cereal: oatmeal should be given preference; Wheatena, hominy grits may be introduced for variety, and occasionally a ready-to-eat cereal, especially in the summer.

A generous supply of milk should be served with any of these, but no sugar need be added.

Stale bread: as toast, zweiback, very crusty rolls baked a second time after they are at least a day old. These help to develop chewing habits.

Milk to drink: never very cold, and may be served hot on winter mornings. Weak cocoa may also be given.

Mid-morning Luncheon:

Crackers: such as graham, whole wheat, Uneeda.

Fruit: ripe apple, fig, dates, or raisins.

Noon Meal:

Soup: made with milk and vegetable juice, or pulp.

An egg: dropped on toast, or poached, or made into an omelet, but never fried.

A green vegetable: of mild flavor, mashed or finely chopped. Spinach (rich in iron), carrots, peas. Potato, and asparagus tips are all valuable.

Since it is undesirable for the child under seven or eight years to have meat, much of the variety in the diet comes through the wise choice and careful cooking of vegetables. By forming this good eating habit the child is furnished with building material while he is young, and with a means of keeping the body in good condition as he grows older.

Dessert:

Let this be kept simple, as: rice and milk, cereal puddings, baked custard, junket, and blanc mange. Frozen creams are also allowed, but milk sherbets are better than sweet creams.

Afternoon luncheon:

Crackers, or sponge cake.

Milk.

Fruit, or baked custard.

Supper:

This meal should be very simple up to the eighth or ninth year, and served not later than six o'clock.

Bread and milk.

Milk toast.

Creamy egg on toast.

Children from two to five years of age thrive best with about 10% protein in the total food. If the protein is increased beyond 15%, there is a direct rise in heat output. There is, furthermore, interference with the body's ability to store protein for tissue. Beef juice and meats should be kept out of the diet for the following reasons: their flavor is too high and tends to throw bland foods into disfavor; meats are more expensive than other foods furnishing protein, such as milk and eggs, and they tend to putrefaction in the large intestine. Children are more sensitive than adults to putrefactive organisms.

As soon as the child begins going to school, the tendency to slight breakfast must be guarded against carefully. The

results of carelessness with this meal are lack of appetite, anæmia, and stunted growth. A regular schedule for meals is an essential to good digestion. The morning and afternoon luncheons must be simple: no other nibbling between meals should be allowed.

After the sixth or seventh year sugar may be given — candy, very simple, *after* meals, never between meals. If the extra meals always consist of only one or two simple foods, they will be naturally discontinued when the child no longer feels hungry for them; yet while there is really need of extra fuel, that need will be met.

GENERAL PRINCIPLES OF FEEDING SICK CHILDREN

Since this work has been chiefly devoted, as the title implies, to the relationship between diet and disease, the amount of space given to the feeding of presumably normal children may occasion some wonderment. But the chief difference between the dietetics of the infant and adult lies in the fact that the bottle infant and the weanling, nominally healthy, have to be dieted to prevent disease. This has now come to be realized on all sides. In classic and mediæval times an infant which could not get breast milk usually perished. The weaning period was somewhat less trying, but millions of children must have succumbed to the ordeal of changing to solid food. Improvement in feeding means a direct lessening of infant mortality, as modern statistics testify.

Colic and Vomiting (Regurgitation) are almost physiological, so common is their occurrence: they do not arise from any single cause, and the fact that breast-fed infants suffer almost as frequently as the bottle-fed, often more so, shows that such ailments are not entirely preventable by care in feeding. In breast-fed children, these symptoms are best controlled by lengthening the period between feedings. In bottle-fed children, besides lengthening the nursing interval, special pains should be taken in the modification of the milk. These symptoms may occur quite independently of diet. Chilling of the body surface, coughing, improper handling, a too snug

binder, etc., may be the true cause of the trouble. Even in breast-fed infants under ideal conditions, the mother's milk may not be well-borne. It may in fact be so rich in fat and protein as to require dilution; which of course in the breast-fed may be accomplished only by giving the infant water before or after nursing.

Gavage. Of late years the use of the stomach sound in feeding sick nurslings has come into considerable vogue in foundling asylums and the like. This resource has a considerable range of application. Thus in premature infants (which do not nurse readily); in all infants which refuse to nurse; and in infants sick from any cause, especially when the nerve centers, swallowing or breathing apparatus are involved, or when continuous vomiting is present, the use of the stomach tube may save life. Very young babies are fed much more readily than older ones, since they are less liable to fright. The tube used is a soft rubber catheter, which is coupled with a small funnel. The catheter is first passed down the gullet. In order to have plenty of leeway, it is an advantage to unite the catheter to a second rubber tube with a piece of glass tubing. The second rubber tube is then coupled to the funnel. If the case be one of vomiting, it is often necessary to wash out the stomach before the introduction of nourishment, however given. The term *lavage,* used for washing out the stomach, must not be confounded with *garage,* which means literally forced feeding. Complete details will be found in works on obstetrics and obstetric nursing. Edgar says of gavage, that the infant to be fed should lie on its back in the nurse's arms, its own arms held to its sides, while an extra assistant steadies the head. The tube having been passed, the modified milk or other nutriment is poured into the funnel, and as the latter empties itself the tube is pinched to prevent escape. While regurgitation may occur and necessitate a repetition of the act, it very often happens that food taken in this manner is much better retained than if taken by nursing the breast or bottle. The exertion required by nursing, the swallowing of air, etc., are

avoided in gavage. To recapitulate, the conditions in which gavage has been found life saving, are given by Edgar in the following order:

Prematurity (especially in incubator babies); after operations on the nose and throat; habitual vomiting; pneumonia, diphtheria and scarlet fever. The jaws of the nursling can usually be separated to receive the gavage-tube. But if there is inflammation of the mouth or locking of the jaws (or if intubation has been required for diphtheritic cases) it may be necessary to resort to nasal feeding (see p. 79).

Diarrhœa. Under this familiar term, which includes the mildest looseness of the bowels as well as the severest symptoms of cholera and dysentery, may be included the greater part of the morbidity of the nursling. Death certificates of babies, especially in summer months, chiefly specify this cause. The diarrhœa makes itself felt in a variety of ways. If conjoined with vomiting we may term it a gastro-enteritis, and state that a given child died from inability to profit by its nourishment. But many infants succumb, not because their nourishment is rejected outright, but rather from the fact that it is not utilized. We can understand death when due to violent vomiting and diarrhœa; but the slow death from non-utilization of food, such as occurs so extensively in bottle-fed tenement house children, still remains largely a mystery, which has been explained in the most diverse ways. The amount and character of gastro-intestinal disturbance present is not sufficient, in many cases at least, to explain the total failure of nutrition. It is in the effort to combat this condition that so many methods of feeding have come into use. As in all stubborn and imperfectly understood conditions, with a bad outlook for recovery, many substances have been tested, and many recoveries have been recorded. If a threatening diarrhœa appears, with or without vomiting, the best course to pursue at first seems to be fasting. Sterile water may be allowed but milk is prohibited. It is believed by some authorities that cow's milk or the milk of any animal is poisonous in these cases. Others would state that milk is dangerous

because of one or another solid ingredient, or because it furnishes a culture medium for germs. In any case some pre-digested food like panopepton, or some cereal decoction like rice or barley water seems better borne. It may also be advisable at this stage to use certain drugs to control vomiting. When the latter has ceased for twenty-four hours, normal feeding may be cautiously resumed. The treatment of these cases taxes the utmost resources of the physician, and the mortality is enormous. The nurse's duties lie rather in the direction of prevention; but if these cases develop, rest of the stomach is imperative at first and milk must not be resumed until all symptoms are passed. Diarrhœa, dysentery and all gastro-intestinal troubles in older children are dieted on the same principles as are the same affections in adults.

Constipation in nurslings is a condition difficult to overcome entirely by diet. The familiar remedies are sugar and cream, an excess of either of which, over dietetic requirements, may loosen the bowels. A prescription of laboratory milk may meet this obstacle, or the corresponding home modification. Fruit juices, oatmeal gruel, etc., are sometimes employed.

Marasmus and *Rickets* are two conditions generally included under diseases amenable to diet. There is no special regimen, however, for such affections: a full balanced diet cannot be improved on. Infantile Scurvy should be named in the same connection, and is the result of an unbalanced diet. Orange juice and a change in the diet will usually cure the disease promptly.

CHAPTER XXIII

THE ADOLESCENT—THE SEDENTARY—THE AGED

DIET FOR THE ADOLESCENT

The growing youth needs extra protein food for the building of protoplasm and a sufficiency of salts for the rapidly forming tissues; earthly salts for bones, iron for blood, phosphorus for nervous tissue and its general influence on growth, obtained from the average liberal mixed diet with milk, eggs, fresh fruit and green vegetables, so that no special plan of feeding is required. If the adolescent lead a very active existence, equivalent to hard labor in an adult, he will naturally require the same amount of food with necessary reduction for weight, and some allowance for extra protein. Many adolescents, however, are very sluggish and lead inactive lives, and need encouragement to activity, with food in proportion to its degree. Again the appetite is not always a safe guide, especially for girls; for the period of adolescence coincides with the development of "hysterical" tendencies which may be manifested by excessive or diminished craving for food without any reference to the actual physical demands. Girls should be trained out of fads. An active adolescent may have but little appetite while a sluggish one may be a glutton, or may continually drink water. The perverted cravings for substances of no nutritive value and without appetizing quality, which accompany this period, are well known. It is therefore necessary that the diet of this period be as carefully supervised as that for the little child. The food must conform to the subject's physical requirements, must be eaten *regularly,* and must be administered with discretion, for a large percentage of food aversions are acquired at this time, and it is essential to the well-being of the individual, and the

comfort of others, that his food habits be good. In college food should be prepared with reference to work.

The energy requirements of this period are approximately:[1]

Age in Years	Protein Calories per Pound	Total Calories per Pound
12–13	3	25–30
14–17		20–25

"This means that the total daily requirements for girls from fourteen to seventeen will be from 2200 to 2600 Calories; for boys of the same age from 2500 to 3000 Calories. Very often by this time the full height will have been attained and the parents are surprised at the large consumption of food, thinking that growth has ceased. But growth is not merely a question of height. As already said, it involves laying on of muscle and fat, development of internal organs and a vigorous nervous system, and these demand food. Furthermore, muscular activity, especially out of doors, is a great aid in muscle and nerve development, and the extra fuel required to support this activity should never be begrudged young people. For five or ten years after full height is reached their food consumption will be considerably higher than that of adults of the same size. As long as they confine themselves to simple, nourishing foods they are not likely to overeat. Sometimes their expenditures in growth and activity exceed their assimilative powers. Especially is this true of those who grow very tall with great rapidity and indulge freely in active sports and dancing. To leave a balance in favor of the body it may be for a time necessary to curtail the activity somewhat — to insist on longer hours for rest and less violent exercise until substantial gains in weight and other signs of physical welfare show that the energy demands are not greater than the energy supply."

"The daily menu list may well include such dishes as the following:

1 Much practical information in reference to feeding the adolescent is to be found in "Feeding the Family" by Dr. Mary Swartz Rose. The Macmillan Co., New York.

1. Soup, as tomato, green pea, split pea, white and black bean.
2. Two or three hot dishes, as spaghetti with tomato sauce, mashed potatoes with green peas, baked beans, corn pudding, a stew with vegetables or a hot roast beef sandwich.
3. Salads, as potato, egg, fruit, or green vegetable.
4. Sandwiches, one or two varieties each day.
5. Fruit, as apples, bananas, stewed fruits of various kinds.
6. Milk and cocoa.
7. Plain cake or sweet wafers offered only in combination with milk or other plain food.
8. Ice cream, charlotte russe, simple baked pudding, sweet chocolate.

The evening meal needs to be more substantial than for the younger children. In the city this will be the time for the regular dinner; in the country it is more likely to be supper. Here we must guard against extremes — too heavy a meal on the one hand and too light on the other. Supper should include one substantial warm dish as a rule. This may be a thick soup, as suggested for the younger children, macaroni and cheese, a stew or chowder, or a loaf of beans or lentils with a cream or tomato sauce. This with plenty of bread and butter, some stewed fruit and cookies, or a wholesome pudding, and milk to drink, will make a sufficiently nourishing repast."

DIET FOR THE SEDENTARY

No exact rules can be laid down for the dietetics of the sedentary. An individual may lead a technically sedentary life, and yet use up a great amount of energy, only standing and walking muscles being in disuse just as in a person whose occupation requires standing and walking, little use may be made of arm, shoulder and trunk muscles. A better distinction is between out-door and in-door life, or quiet and active existence. True sedentary persons lead both a quiescent and an in-door existence, chiefly in the sitting posture. The less the exertion, the less the requirement for food. Excess of food over actual demands is usually manifested by the putting

on of flesh or by the development of indigestion or metabolic disturbances. In theory there should be no such thing as a permissible diet for the sedentary, because no one should allow himself to lead a purely quiescent existence. It is possible to compress a good deal of active exercise in a couple of hours of the twenty-four, so that the sedentary person passes virtually into the next class above, corresponding to light active labor extending through a number of hours.

While individual estimates vary, it is probable that 1600–2000 calories suffice for the average individual on the usual basis of 145 pounds weight with the usual reduction for sex. As the sedentary person finds it difficult to digest heavy articles of food, the food should be easily digestible. Fruit and succulent vegetables (salads) are usually well borne by sedentary people, as they induce daily evacuations of the bowels, and are not fattening. They are the reverse of condensed and highly nutritious foods.

DIET FOR THE AGED

As there is a radical distinction between a person merely old in years and one who is actually senile, no dietary can be devised to suit the case of all those of advanced years. A man is technically old at sixty. In theory he should require less protein in proportion to carbohydrates than a younger man. Many people of both sexes, however, preserve their working capacity far into the sixties and even into the seventies. Many people can put on flesh up to the age of sixty, and it is very important that they do not do so. Their regimen should be practically that of the corpulent. After the age of sixty the weight may remain at an equilibrium for some years, or with the advent of senile change, the flesh may begin to disappear, this loss being physiological. At this period less depends on the selection of food than on the quantity and thoroughness of mastication. An active, healthy man can preserve his condition by cutting down the amount of food greatly, and chewing it thoroughly. The demand for protein will very likely be satisfied with a small quantity.

The total fuel requirement will depend upon whether the individual exercises or leads a sedentary life. Sedentary elderly people can subsist on very little food, and do not differ much in this respect from middle-aged sedentary people.

A senile person is practically an invalid, and his dietetic demands do not differ greatly from those of other invalids (aside from the convalescent). If the teeth are more or less useless, and mastication cannot be effected by the gums, the individual becomes a confirmed dyspeptic. The problem of starch digestion becomes a serious one. Milk can be used largely.

In theory sugars could partially replace starches. An excellent food under the circumstances is toasted bread, which may be dipped in coffee to soften it. In toast the starch becomes changed to dextrin, which is but one step removed from sugar. Well-cooked cereals, vegetables (potatoes, greens, etc.) and fruits may be used in small quantities in the expectation that they will be digested by the pancreatic juice.

Special Regimen: As already suggested, this cannot differ in kind from that of the confined invalid or dyspeptic.

DIET[1]: *Soup.*— Nutritious soups, such as chicken or fish purée, beef tea, mutton or chicken broth. Purées of all kinds.

Fish.— White fish as sole, whiting, smelts, flounders, etc. (best when boiled).

Eggs.— Egg lightly cooked, or beaten up with milk, etc.

Meats.— Young and tender chicken and game. Other tender meats. Potted chicken, game and other potted meats. Sweetbreads, bacon grilled.

Farinaceous.— Bread and butter (bread at least a day old) to be soaked in tea or milk or water. Bread and milk, porridge and oatmeal gruel. Puddings of ground rice, tapioca, arrowroot, sago, macaroni. Prepared foods consisting of predigested starches.

Vegetables.— Potatoes, carrots, spinach and other succulent vegetables, stewed celery, boiled onions.

Desserts.— Fruit jellies, stewed or baked fruit. Pulp of perfectly ripe raw fruit in small quantity, farinaceous puddings.

Liquids.— Milk in all forms, and with the addition of warm Vichy or warm water, fruit juice.

[1] Food suitable for the Aged According to Yeo.

AVERAGE WEIGHT OF OLD MEN AND WOMEN[1]

Age in Years	Men Pounds	Women Pounds
60	144	125
70	139	125
80	135	113
90	127	109

[2] "It is roughly estimated that the decrease in food requirement due to old age, from the total fuel which would be required by an adult of the same degree of activity, is about 10 per cent. between the ages of sixty and seventy; about 20 per cent. between seventy and eighty; and about 30 per cent after that. In other words a man who at thirty requires per day 2000 Calories simply sitting at rest, will require under the same circumstances only about 1800 at seventy and only 1600 at eighty. The ordinary activities of a man of thirty may raise his energy output to 3500 Calories per day, but few men of eighty could do sufficient muscular work to transform so much additional fuel. Their lives are likely to be decidedly sedentary; hence 1600 to 1800 Calories will probably closely approximate their total daily expenditure, though no absolute rule can be laid down. In general, there is safety in abstemiousness: dangers of excess are greater than dangers of undernutrition."

1 From Bulletin No. 223, Office of Experiment Stations, U. S. Department of Agriculture (calculated to pounds).

2 Much practical information in reference to feeding the aged is to be found in "Feeding the Family" by Dr. Mary Swartz Rose. The Macmillan Co., New York.

SYMONDS'S TABLE OF HEIGHT AND WEIGHT FOR MEN AT DIFFERENT AGES [1]

(Based on 74,162 accepted applicants for life insurance.)

Ages	15-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65-69
5 ft. 0 in.	120	125	128	131	133	134	134	134	131	
1 in.	122	126	129	131	134	136	136	136	134	
2 in.	124	128	131	133	136	138	138	138	137	
3 in.	127	131	134	136	139	141	141	141	140	140
4 in.	131	135	138	140	143	144	145	145	144	143
5 in.	134	138	141	143	146	147	149	149	148	147
6 in.	138	142	145	147	150	151	153	153	153	151
7 in.	142	147	150	152	155	156	158	158	158	156
8 in.	146	151	154	157	160	161	163	163	163	162
9 in.	150	155	159	162	165	166	167	168	168	168
10 in.	154	159	164	167	170	171	172	173	174	174
11 in.	159	164	169	173	175	177	177	178	180	180
6 ft. 0 in.	165	170	175	179	180	183	182	183	185	185
1 in.	170	177	181	185	186	189	188	189	189	189
2 in.	176	184	188	192	194	196	194	194	192	192
3 in.	181	190	195	200	203	204	201	198		

SYMONDS'S TABLE OF HEIGHT AND WEIGHT FOR WOMEN AT DIFFERENT AGES [2]

(Based on 58,855 accepted applicants for life insurance.)

Ages	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64
4 ft. 11 in.	111	113	115	117	119	122	125	128	128	126
5 ft. 0 in.	113	114	117	119	122	125	128	130	131	129
1 in.	115	116	118	121	124	128	131	133	134	132
2 in.	117	118	120	123	127	132	134	137	137	136
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1 *Medical Record*, Sept. 5, 1908. "Feeding the Family," page 429.
2 *McClure's Magazine*, Jan., 1909. "Feeding the Family," page 430.

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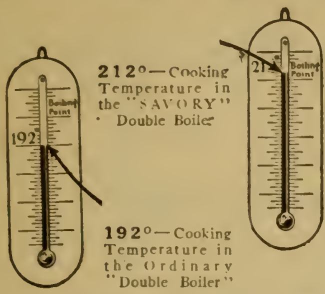

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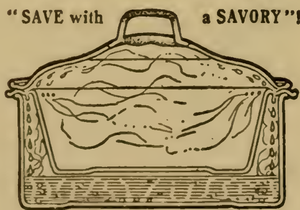

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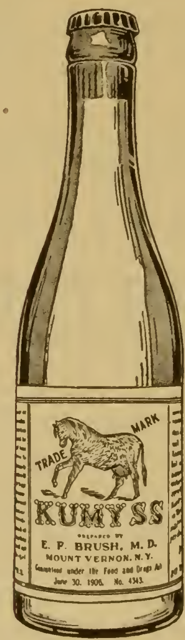

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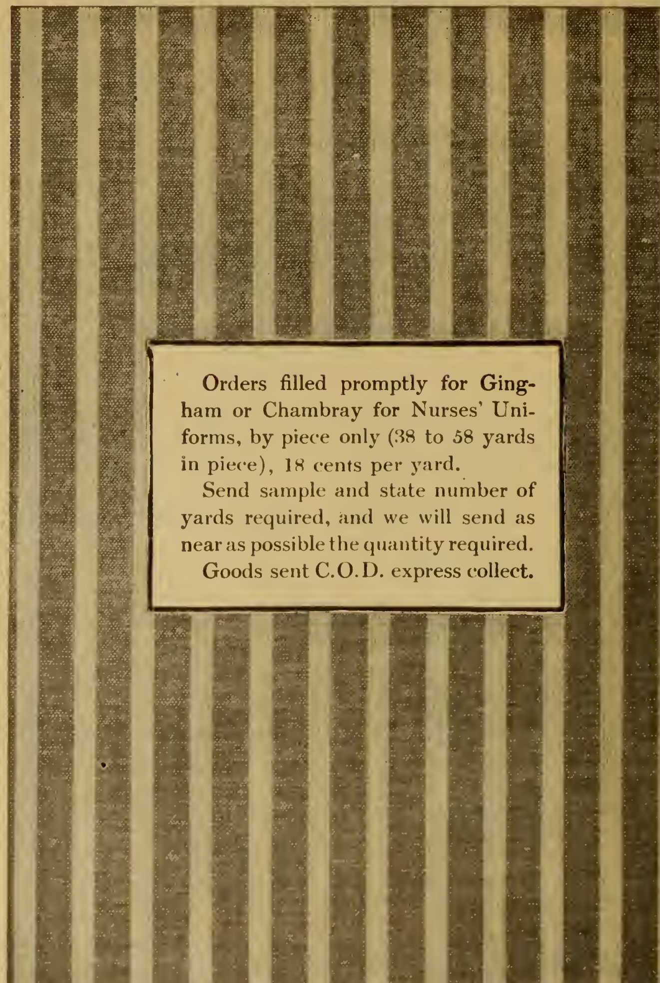

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